Airwell

Service Manual

DLS Series

Indoor Units	Outdoor Units
DLS 18	GC18
	GC18T
	ONG3-17
DLS 24	GCN 24
	GCN 24Z
	GCN 24T
DLS 30	GCN 30
	GCN 30T
DLS 37	GCN 37
	GCN 37T
DLS 44	GCN 42
	GCN 40T

REFRIGERANT

COOLING ONLY

R410A

HEAT PUMP

SM DLSRPM 1-A.4 GB

DECEMBER – 2008

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LIST OF EFFECTIVE PAGES

Note: Changes in the pages are indicated by a “Revision#” in the footer of each effected page (when none indicates no changes in the relevant page). All pages in the following list represent effected/ non effected pages divided by chapters.

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1. INTRODUCTION

1.1 General

The new **DLS** ducted split unit range comprises the ST (cooling only) as well as RC (heat pump) models, it is available at 1PH, 3PH as follow:

- **1PH => DLS 18, 24, 30, 37, 44**

- **3PH** => **DLS 18, 24, 30, 37, 44**

Remote control compatibility

- The **DLS** unit is compatible with remote controls RC3, RC4, RCW1, RCW2

1.2 Main Features

The **DLS** series benefits from the most advanced technological innovations, namely:

- R410A refrigerant for all the range.
- The only Single Fan, medium capacity, low silhouette ducted unit
- High Static Pressure in the low silhouette category.
- Low indoor and outdoor sound level
- Low Silhouette 260-300 mm height that simplify the false ceiling construction.
- Small volume, easy for installation (require small space for installation)
- Water drainage capability without siphon near the unit.
- Built in over-flow protection against condensate water
- 50 meters pipes installation in charge-less system
- High COP by switching to R 410A and enlarging indoor coil sizes
- Complies with M1 regulations
- Compatible with an “all season kit” that permits operation in cooling mode up to -10ºC outdoor temperature.
- Easy service access by removing the drain pan.
- Microprocessor control.
- Infrared remote control with liquid crystal display.

1.3 Indoor Unit

The indoor unit can fit easily to many types of residential and commercials applications.

It includes:

- High technology plastic fan and fan housing.
- A drain pool that is under the entire unit with internal downward slope.
- An over-flow switch that stops compressor operation in case drainage tube is blocked.
- A bended coil with treated aluminium fins.
- 3-speed fan motor with internal protection with extra speed for higher external static pressure.
- Advanced electronic control box assembly with 1.8 meter cable to allow easy installation .
- All the tubing connections are in the back of the unit to allow easy outlet to left or right side of the unit.
- Field options:
  (1) Electrical Heaters for 2005
  (2) External water pump
  (3) Airconet connection
  (4) Plenum kit for connection of flexible hoses at air outlet.

1.4 Filtration

- The unit is equipped with pre filters.
- Easy and versatile access, rear or bottom, can be easily adjusted by the installer.

1.5 Ionizer (Optional)

A special design Ioniser protected by unique patents integrated into the indoor unit, generating negative ions to the room providing comfort and upgraded indoor air quality.

1.6 Control

The microprocessor indoor controller, and an infrared remote control, supplied as standard, provides complete operating function and programming. For further details, please refer to the Operation Manual,

1.7 Outdoor Unit

The **DLS** outdoor units can be installed as floor or wall mounted units by using a wall-supporting bracket. The metal sheets are protected by anti- corrosion paint work allowing long life resistance. All outdoor units are pre-charged. For further information, please refer to the Product Data Sheet, Chapter 2.

It includes:

- Compressor mounted in a soundproofed compartment :

  Rotary – for **DLS 18, 24, 30, 37**

  Scroll – for **DLS 42, 44**

- Improved 3 - blades axial fans for noise reduction.
- Outdoor coil with hydrophilic fins for RC units.
- Fan grill air outlet.
- Service valves" flare" type connection.
- Service ports for high/ low pressure measurement.
- Interconnecting wiring terminal block.

1.8 Tubing Connections

Flare type-interconnecting tubing to be produced on site.
All the units from 7KW and up can be installed with 50 m tubing length and 25 m height difference without oil traps.
For further details, please refer to the Installation Manual.

1.9 Accessories

ASK (All Season Kit):

For low ambient working conditions in cooling, an ASK can be installed inside the outdoor unit. This kit allows cooling operation down to outdoor temperature of -10 ºC by gradually controlling the outdoor fan speed motor.

RCW Wall Mounted Remote Control

The RCW remote control is mounted on the wall, and controls the unit either as an infrared remote control or as a wired controller. The wired controller can control up to 10 Indoor units with the same program settings and adjustments.
For further details, please refer to the Technical Service Manual.

1.10 Inbox Documentation

Each unit includes its own installation and operation manuals.

2. PRODUCT DATA SHEET

2.1 DLS 18 / GC 18 1PH R410A

Model Indoor Unit				**DLS 18**		
Model Outdoor Unit				**GC 18 R410A**		
Installation Method				**DUCTED**		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity(1)			Btu/hr	19100		18000
			kW	5.6		5.3
Power Input(1)			kW	1.8		1.7
COP(1)			W/W	3.05		3.12
Energy Efficiency Class				B		D
Power Supply			V/Ph/Hz	230/50/1		
Rated Current			A	8.2		7.5
Starting Current			A	43		
Circuit Breaker Rating			A	20		
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1		
	Fan Speed	H/M/L	RPM	630	530	425
	Airflow(2)	H/M/L	m³/hr	1150	875	730
	External Static Pressure	Min-Max	Pa	25-60		
	Sound Power Level(3)	H/M/L	dB (A)	55	53	50
	Sound Pressure Level (4)	H/M/L	dB (A)	45	42	40
	Moisture Removal		L/hr	2.0		
	Condensate Drain Tube I.D.		mm	19		
	Dimensions	W/H/D	mm	770	260	690
	Weight		kg	29		
	Package Dimensions	W/H/D	mm	949	315	851
	Packaged Weight		kg	31		
	Units per Pallet		Units	6		
	Stacking Height		Units	6		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial & 1		
	Fan Speeds	H/L	RPM	815		
	Airflow	H/L	m³/hr	2480		
	Sound Power Level	H/L	dB (A)	68		
	Sound Pressure Level (4)	H/L	dB (A)	58		
	Dimensions	W/H/D	mm	846	690	302
	Weight		kg	56		
	Package Dimensions	W/H/D	mm	990	770	430
	Packaged Weight		kg	61		
	Units per Pallet		Units	9		
	Stacking Height		Units	3		
	Refrigerant Type			R 410A		
	Refrigerant Chargeless Distance		kg/m	1.75/10.0		
	Additional Charge Per 1 Meter		g/m	25		
	Connections Between Units	Liquid Line	In	1/4"		
		Suction Line	In	1/2"		
		Max. Tubing Length	m	25		
		Max. Height Difference	m	15		
Operation Control Type				LCD Remote Control		
Heating Elements			kW			
Others						

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.2 DLS 18 / GC 18T R410A

Model Indoor Unit				DLS 18		
Model Outdoor Unit				GC 18T R410A		
Installation Method				DUCTED		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity(1)			Btu/hr	19100		18000
			kW	5.6		5.3
Power Input(1)			kW	1.8		1.7
COP(1)			W/W	3.05		3.12
Energy Efficiency Class				B		D
Power Supply			V/Ph/Hz	400/50/1		
Rated Current			A	3*3.5		3*3.1
Starting Current			A	26		
Circuit Breaker Rating			A	3*10		
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1		
	Fan Speed	H/M/L	RPM	630	530	425
	Airflow(2)	H/M/L	m³/hr	1150	875	730
	External Static Pressure	Min-Max	Pa	25-60		
	Sound Power Level(3)	H/M/L	dB (A)	55	53	50
	Sound Pressure Level (4)	H/M/L	dB (A)	45	42	40
	Moisture Removal		L/hr	2.0		
	Condensate Drain Tube I.D.		mm	19		
	Dimensions	W/H/D	mm	790	256	749
	Weight		kg	29		
	Package Dimensions	W/H/D	mm	959	315	854
	Packaged Weight		kg	31		
	Units per Pallet		Units	6		
	Stacking Height		Units	6		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial & 1		
	Fan Speeds	H/L	RPM	815		
	Airflow	H/L	m³/hr	2480		
	Sound Power Level	H/L	dB (A)	68		
	Sound Pressure Level (4)	H/L	dB (A)	58		
	Dimensions	W/H/D	mm	846	690	302
	Weight		kg	56		
	Package Dimensions	W/H/D	mm	990	770	430
	Packaged Weight		kg	61		
	Units per Pallet		Units	9		
	Stacking Height		Units	3		
	Refrigerant Type			R 410A		
	Refrigerant Chargeless Distance		kg/m	1.98/10.0		
	Additional Charge Per 1 Meter		g/m	25		
	Connections Between Units	Liquid Line	In	1/4"		
		Suction Line	In	1/2"		
		Max. Tubing Length	m	25		
		Max. Height Difference	m	15		
Operation Control Type				LCD Remote Control		
Heating Elements			kW			
Others						

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.3 DLS 24 / GCN 24 1PH R410A

Model Indoor Unit				**DLS 24**		
Model Outdoor Unit				**GCN 24 R410A**		
Installation Method				**DUCTED**		
Characteristics			**Units**	**Cooling**	**Heating**	
Capacity(1)			Btu/hr	23500	23850	
			kW	6.9	7.0	
Power Input(1)			kW	2.4	2.3	
COP(1)			W/W	2.9	3.04	
Energy Efficiency Class				C	D	
Power Supply			V/Ph/Hz	230/50/1		
Rated Current			A	10.8	10.5	
Starting Current			A	66		
Circuit Breaker Rating			A	20		
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1		
	Fan Speed	H/M/L	RPM	680	630	880
	Airflow(2)	H/M/L	m³/hr	1210	1100	840
	External Static Pressure	Min-Max	Pa	25-60		
	Sound Power Level(3)	H/M/L	dB (A)	60	58	55
	Sound Pressure Level (4)	H/M/L	dB (A)	48	45	43
	Moisture Removal		L/hr	2.3		
	Condensate Drain Tube I.D.		mm	19		
	Dimensions	W/H/D	mm	790	256	749
	Weight		kg	29		
	Package Dimensions	W/H/D	mm	959	315	854
	Packaged Weight		kg	31		
	Units per Pallet		Units	6		
	Stacking Height		Units	6		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial & 1		
	Fan Speeds	H/L	RPM	850		
	Airflow	H/L	m³/hr	3100		
	Sound Power Level	H/L	dB (A)	67		
	Sound Pressure Level (4)	H/L	dB (A)	58		
	Dimensions	W/H/D	mm	900	680	340
	Weight		kg	78		
	Package Dimensions	W/H/D	mm	985	730	435
	Packaged Weight		kg	82		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R 410A		
	Refrigerant Chargeless Distance		kg/m	2.16/12.5		
	Additional Charge Per 1 Meter		g/m	25		
	Connections Between Units	Liquid Line	In	3/8"		
		Suction Line	In	5/8		
		Max. Tubing Length	m	50		
		Max. Height Difference	m	25		
Operation Control Type				LCD Remote Control		
Heating Elements			kW			
Others						

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.4 DLS 24 / GCN 24T R410A

Model Indoor Unit				DLS 24		
Model Outdoor Unit				GCN 24T R410A		
Installation Method				DUCTED		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity(1)			Btu/hr	23500		23850
			kW	6.9		7.0
Power Input(1)			kW	2.4		2.3
COP(1)			W/W	2.9		3.03
Energy Efficiency Class				C		D
Power Supply			V/Ph/Hz	400/50/3		
Rated Current			A	3*6		3*5.4
Starting Current			A			
Circuit Breaker Rating			A	3*10		
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1		
	Fan Speed	H/M/L	RPM	680	630	530
	Airflow(2)	H/M/L	m^3/hr	1210	1100	880
	External Static Pressure	Min-Max	Pa	25-60		
	Sound Power Level(3)	H/M/L	dB (A)	60	58	55
	Sound Pressure Level (4)	H/M/L	dB (A)	48	45	43
	Moisture Removal		L/hr	2.3		
	Condensate Drain Tube I.D.		mm	19		
	Dimensions	W/H/D	mm	790	256	749
	Weight		kg	29		
	Package Dimensions	W/H/D	mm	959	315	854
	Packaged Weight		kg	31		
	Units per Pallet		Units	6		
	Stacking Height		Units	6		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial & 1		
	Fan Speeds	H/L	RPM	850		
	Airflow	H/L	m^3/hr	3100		
	Sound Power Level	H/L	dB (A)	67		
	Sound Pressure Level (4)	H/L	dB (A)	58		
	Dimensions	W/H/D	mm	900	680	340
	Weight		kg	78		
	Package Dimensions	W/H/D	mm	985	730	435
	Packaged Weight		kg	82		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R 410A		
	Refrigerant Chargeless Distance		kg/m	2.16/12.5		
	Additional Charge Per 1 Meter		g/m	25		
	Connections Between Units	Liquid Line	In	3/8"		
		Suction Line	In	5/8”		
		Max. Tubing Length	m	50		
		Max. Height Difference	m	25		
Operation Control Type				LCD Remote Control		
Heating Elements			kW			
Others				Crankcase heater (50W), 3Phase Protector		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.5 DLS 24 / GCN 24Z 1PH R410A

Model Indoor Unit				**DLS 24**		
Model Outdoor Unit				**GCN 24Z R410A**		
Installation Method				**DUCTED**		
Characteristics			**Units**	**Cooling**	**Heating**	
Capacity(1)			Btu/hr	23500	23850	
			kW	6.9	7.0	
Power Input(1)			kW	2.4	2.3	
COP(1)			W/W	2.9	3.04	
Energy Efficiency Class				C	D	
Power Supply			V/Ph/Hz	230/50/1		
Rated Current			A	10.8	10.5	
Starting Current			A	66		
Circuit Breaker Rating			A	20		
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1		
	Fan Speed	H/M/L	RPM	880	680	630
	Airflow(2)	H/M/L	m^3/hr	1210	1100	840
	External Static Pressure	Min-Max	Pa	25-60		
	Sound Power Level(3)	H/M/L	dB (A)	60	58	55
	Sound Pressure Level (4)	H/M/L	dB (A)	48	45	43
	Moisture Removal		L/hr	2.3		
	Condensate Drain Tube I.D.		mm	19		
	Dimensions	W/H/D	mm	790	256	749
	Weight		kg	29		
	Package Dimensions	W/H/D	mm	959	315	854
	Packaged Weight		kg	31		
	Units per Pallet		Units	6		
	Stacking Height		Units	6		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial & 1		
	Fan Speeds	H/L	RPM	850		
	Airflow	H/L	m^3/hr	3100		
	Sound Power Level	H/L	dB (A)	67		
	Sound Pressure Level (4)	H/L	dB (A)	58		
	Dimensions	W/H/D	mm	900	680	340
	Weight		kg	78		
	Package Dimensions	W/H/D	mm	985	730	435
	Packaged Weight		kg	82		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R 410A		
	Refrigerant Chargeless Distance		kg/m	2.02/15.0		
	Additional Charge Per 1 Meter		g/m	25		
	Connections Between Units	Liquid Line	In	3/8"		
		Suction Line	In	5/8"		
		Max. Tubing Length	m	15		
		Max. Height Difference	m	7		
Operation Control Type				LCD Remote Control		
Heating Elements			kW			
Others						

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.6 DLS 30 / GCN 30 1PH R410A

Model Indoor Unit				DLS 30		
Model Outdoor Unit				GCN 30 R410A		
Installation Method				DUCTED		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity(1)			Btu/hr	29000		30700
			kW	8.5		9.0
Power Input(1)			kW	3.0		2.8
COP(1)			W/W	2.81		3.22
Energy Efficiency Class				C		D
Power Supply			V/Ph/Hz	230/50/1		
Rated Current			A	13.7		12.5
Starting Current			A	80		
Circuit Breaker Rating			A	25		
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1		
	Fan Speed	H/M/L	RPM	800	670	550
	Airflow(2)	H/M/L	m³/hr	1420	1170	935
	External Static Pressure	Min-Max	Pa	37-80		
	Sound Power Level(3)	H/M/L	dB (A)	64	61	58
	Sound Pressure Level (4)	H/M/L	dB (A)	49	46	44
	Moisture Removal		L/hr	3.0		
	Condensate Drain Tube I.D.		mm	19		
	Dimensions	W/H/D	mm	790	256	749
	Weight		kg	31		
	Package Dimensions	W/H/D	mm	959	315	854
	Packaged Weight		kg	33		
	Units per Pallet		Units	6		
	Stacking Height		Units	6		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial & 1		
	Fan Speeds	H/L	RPM	850		
	Airflow	H/L	m³/hr	3150		
	Sound Power Level	H/L	dB (A)	66		
	Sound Pressure Level (4)	H/L	dB (A)	58		
	Dimensions	W/H/D	mm	900	860	340
	Weight		kg	78		
	Package Dimensions	W/H/D	mm	985	907	435
	Packaged Weight		kg	82		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R 410A		
	Refrigerant Chargeless Distance		kg/m	2.42/15.0		
	Additional Charge Per 1 Meter		g/m	25		
	Connections Between Units	Liquid Line	In	3/8"		
		Suction Line	In	5/8”		
		Max. Tubing Length	m	50		
		Max. Height Difference	m	25		
Operation Control Type				LCD Remote Control		
Heating Elements			kW			
Others				Crankcase heater (50W),		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.7 DLS 30 / GCN 30T R410A

Model Indoor Unit				**DLS 30**		
Model Outdoor Unit				**GCN 30T R410A**		
Installation Method				**DUCTED**		
Characteristics			**Units**	**Cooling**	**Heating**	
Capacity(1)			Btu/hr	29000	30700	
			kW	8.5	9.0	
Power Input(1)			kW	3.0	2.8	
COP(1)			W/W	2.82	3.24	
Energy Efficiency Class				C	D	
Power Supply			V/Ph/Hz	400/50/3		
Rated Current			A	3*75	3*71	
Starting Current			A	35		
Circuit Breaker Rating			A	3*16		
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1		
	Fan Speed	H/M/L	RPM	800	670	550
	Airflow(2)	H/M/L	m^3/hr	1420	1170	938
	External Static Pressure	Min-Max	Pa	37-80		
	Sound Power Level(3)	H/M/L	dB (A)	64	61	58
	Sound Pressure Level (4)	H/M/L	dB (A)	49	46	44
	Moisture Removal		L/hr	3.0		
	Condensate Drain Tube I.D.		mm	19		
	Dimensions	W/H/D	mm	790	256	749
	Weight		kg	31		
	Package Dimensions	W/H/D	mm	959	315	854
	Packaged Weight		kg	33		
	Units per Pallet		Units	6		
	Stacking Height		Units	6		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial & 1		
	Fan Speeds	H/L	RPM	850		
	Airflow	H/L	m^3/hr	3150		
	Sound Power Level	H/L	dB (A)	66		
	Sound Pressure Level (4)	H/L	dB (A)	58		
	Dimensions	W/H/D	mm	900	860	340
	Weight		kg	78		
	Package Dimensions	W/H/D	mm	985	730	435
	Packaged Weight		kg	82		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R 410A		
	Refrigerant Chargeless Distance		kg/m	2.42/15.0		
	Additional Charge Per 1 Meter		g/m	25		
	Connections Between Units	Liquid Line	In	3/8"		
		Suction Line	In	5/8”		
		Max. Tubing Length	m	50		
		Max. Height Difference	m	25		
Operation Control Type				LCD Remote Control		
Heating Elements			kW			
Others				Crankcase heater (50W), 3Phase Protector		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.8 DLS 37 / GCN 37 R410A

Model Indoor Unit				**DLS 37**		
Model Outdoor Unit				**GCN 37 R410A**		
Installation Method				**DUCTED**		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity(1)			Btu/hr	36350		38200
			kW	10.6		11.2
Power Input(1)			kW	3.8		3.7
COP(1)			W/W	2.81		3.05
Energy Efficiency Class				C		D
Power Supply			V/Ph/Hz	230/50/1		
Rated Current			A	16.9		16.3
Starting Current			A	92		
Circuit Breaker Rating			A	25		
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1		
	Fan Speed	H/M/L	RPM	775	650	540
	Airflow(2)	H/M/L	m³/hr	1840	1520	1210
	External Static Pressure	Min-Max	Pa	37-100		
	Sound Power Level(3)	H/M/L	dB (A)	67	63	60
	Sound Pressure Level (4)	H/M/L	dB (A)	51	48	45
	Moisture Removal		L/hr	3.7		
	Condensate Drain Tube I.D.		mm	19		
	Dimensions	W/H/D	mm	854	297	816
	Weight		kg	33		
	Package Dimensions	W/H/D	mm	1010	342	917
	Packaged Weight		kg	35		
	Units per Pallet		Units	6		
	Stacking Height		Units	6		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial & 1		
	Fan Speeds	H/L	RPM	1125		
	Airflow	H/L	m³/hr	4150		
	Sound Power Level	H/L	dB (A)	70.9		
	Sound Pressure Level (4)	H/L	dB (A)	63		
	Dimensions	W/H/D	mm	900	970	340
	Weight		kg	87		
	Package Dimensions	W/H/D	mm	985	1020	435
	Packaged Weight		kg	91		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R 410A		
	Refrigerant Chargeless Distance		kg/m	2.55/15		
	Additional Charge Per 1 Meter		g/m	25		
	Connections Between Units	Liquid Line	In	3/8"		
		Suction Line	In	3/4"		
		Max. Tubing Length	m	50		
		Max. Height Difference	m	25		
Operation Control Type				LCD Remote Control		
Heating Elements			kW			
Others				Crankcase heater (50W)		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.9 DLS 37 / GCN 37T R410A

Model Indoor Unit				**DLS 37**			
Model Outdoor Unit				**GCN 37T R410A**			
Installation Method				**DUCTED**			
Characteristics			**Units**	**Cooling**		**Heating**	
Capacity(1)			Btu/hr	35480		37870	
			kW	10.4		11.1	
Power Input(1)			kW	2.83		3.1	
COP(1)			W/W	2.83		3.1	
Energy Efficiency Class				C		D	
Power Supply			V/Ph/Hz	400/50/3			
Rated Current			A	3*10		3*9.6	
Starting Current			A	43			
Circuit Breaker Rating			A	3*16			
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1			
	Fan Speed	H/M/L	RPM	775	650	540	
	Airflow(2)	H/M/L	m^3/hr	1840	1520	1210	
	External Static Pressure	Min-Max	Pa	37-100			
	Sound Power Level(3)	H/M/L	dB (A)	67	63	60	
	Sound Pressure Level (4)	H/M/L	dB (A)	51	48	45	
	Moisture Removal		L/hr	3.7			
	Condensate Drain Tube I.D.		mm	19			
	Dimensions	W/H/D	mm	854	297	816	
	Weight		kg	33			
	Package Dimensions	W/H/D	mm	959	315	854	
	Packaged Weight		kg	33			
	Units per Pallet		Units	6			
	Stacking Height		Units	6			
OUTDOOR	Refrigerant Control			Capillary			
	Compressor Type, Model			Rotary			
	Fan Type & Quantity			Axial & 1			
	Fan Speeds	H/L	RPM	1125			
	Airflow	H/L	m^3/hr	4150			
	Sound Power Level	H/L	dB (A)	70.9			
	Sound Pressure Level (4)	H/L	dB (A)	63			
	Dimensions	W/H/D	mm	900	970	340	
	Weight		kg	87			
	Package Dimensions	W/H/D	mm	985	1020	435	
	Packaged Weight		kg	91			
	Units per Pallet		Units	6			
	Stacking Height		Units	2			
	Refrigerant Type			R 410A			
	Refrigerant Chargeless Distance		kg/m	2.45/15			
	Additional Charge Per 1 Meter		g/m	25			
	Connections Between Units	Liquid Line	In	3/8"			
		Suction Line	In	3/4"			
		Max. Tubing Length	m	50			
		Max. Height Difference	m	25			
Operation Control Type				LCD Remote Control			
Heating Elements			kW				
Others				Crankcase heater (50W), 3Phase Protector			

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.10 DLS 44 / OU10-42 1PH R410A

Model Indoor Unit				**DLS 44**		
Model Outdoor Unit				**OU10-42 R410A**		
Installation Method				**DUCTED**		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity(1)			Btu/hr	41630		44700
			kW	12.20		13.10
Power Input(1)			kW	4.34		4.37
COP(1)			W/W	2.81		3.00
Energy Efficiency Class				C		D
Power Supply			V/Ph/Hz	230/50/1		
Rated Current			A	20.0		19.9
Starting Current			A	85		
Circuit Breaker Rating			A	40		
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1		
	Fan Speed	H/M/L	RPM	870	665	550
	Airflow(2)	H/M/L	m³/hr	2025	1490	1210
	External Static Pressure	Min-Max	Pa	50-100		
	Sound Power Level(3)	H/M/L	dB (A)	71	67	62
	Sound Pressure Level (4)	H/M/L	dB (A)	52	49	47
	Moisture Removal		L/hr	4.7		
	Condensate Drain Tube I.D.		mm	19		
	Dimensions	W/H/D	mm	854	297	816
	Weight		kg	33		
	Package Dimensions	W/H/D	mm	1010	342	917
	Packaged Weight		kg	38		
	Units per Pallet		Units	6		
	Stacking Height		Units	6		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial & 1		
	Fan Speeds	H/L	RPM	1240		
	Airflow	H/L	m³/hr	4350		
	Sound Power Level	H/L	dB (A)	71		
	Sound Pressure Level (4)	H/L	dB (A)	64		
	Dimensions	W/H/D	mm	900	970	340
	Weight		kg	96		
	Package Dimensions	W/H/D	mm	985	1020	435
	Packaged Weight		kg	100		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R 410A		
	Refrigerant Chargeless Distance		kg/m	3.05/15		
	Additional Charge Per 1 Meter		g/m	35		
	Connections Between Units	Liquid Line	In	3/8"		
		Suction Line	In	3/4"		
		Max. Tubing Length	m	50		
		Max. Height Difference	m	25		
Operation Control Type				LCD Remote Control		
Heating Elements			kW			
Others				Crankcase heater (50W)		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.11 DLS 44 / GCN 40T R410A

Model Indoor Unit				**DLS 44**		
Model Outdoor Unit				**GCN 40T R410A**		
Installation Method				**DUCTED**		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity(1)			Btu/hr	43000		48450
			kW	12.6		14.2
Power Input(1)			kW	4.67		4.73
COP(1)			W/W	2.7		3.0
Energy Efficiency Class				D		D
Power Supply			V/Ph/Hz	400/50/3		
Rated Current			A	3*10.5		3*10.5
Starting Current			A	61		
Circuit Breaker Rating			A	3*16		
INDOOR	Fan Type & Quantity			CENTRIFUGAL X1		
	Fan Speed	H/M/L	RPM	870	665	550
	Airflow(2)	H/M/L	m³/hr	2025	1490	1210
	External Static Pressure	Min-Max	Pa	50-100		
	Sound Power Level(3)	H/M/L	dB (A)	71	67	62
	Sound Pressure Level (4)	H/M/L	dB (A)	52	49	47
	Moisture Removal		L/hr	4.8		
	Condensate Drain Tube I.D.		mm	19		
	Dimensions	W/H/D	mm	854	297	816
	Weight		kg	33		
	Package Dimensions	W/H/D	mm	1010	342	917
	Packaged Weight		kg	38		
	Units per Pallet		Units	6		
	Stacking Height		Units	6		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial & 1		
	Fan Speeds	H/L	RPM	1240		
	Airflow	H/L	m³/hr	4350		
	Sound Power Level	H/L	dB (A)	71		
	Sound Pressure Level (4)	H/L	dB (A)	64		
	Dimensions	W/H/D	mm	900	970	340
	Weight		kg	96		
	Package Dimensions	W/H/D	mm	985	1020	435
	Packaged Weight		kg	94		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R 410A		
	Refrigerant Chargeless Distance		kg/m	3.0/15		
	Additional Charge Per 1 Meter		g/m	35		
	Connections Between Units	Liquid Line	In	3/8"		
		Suction Line	In	3/4"		
		Max. Tubing Length	m	50		
		Max. Height Difference	m	25		
Operation Control Type				LCD Remote Control		
Heating Elements			kW			
Others				Crankcase heater (50W), 3Phase Protector		

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

3. RATING CONDITIONS

Standard conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.

Cooling:
Indoor: 27°C DB 19°C WB
Outdoor: 35 °C DB

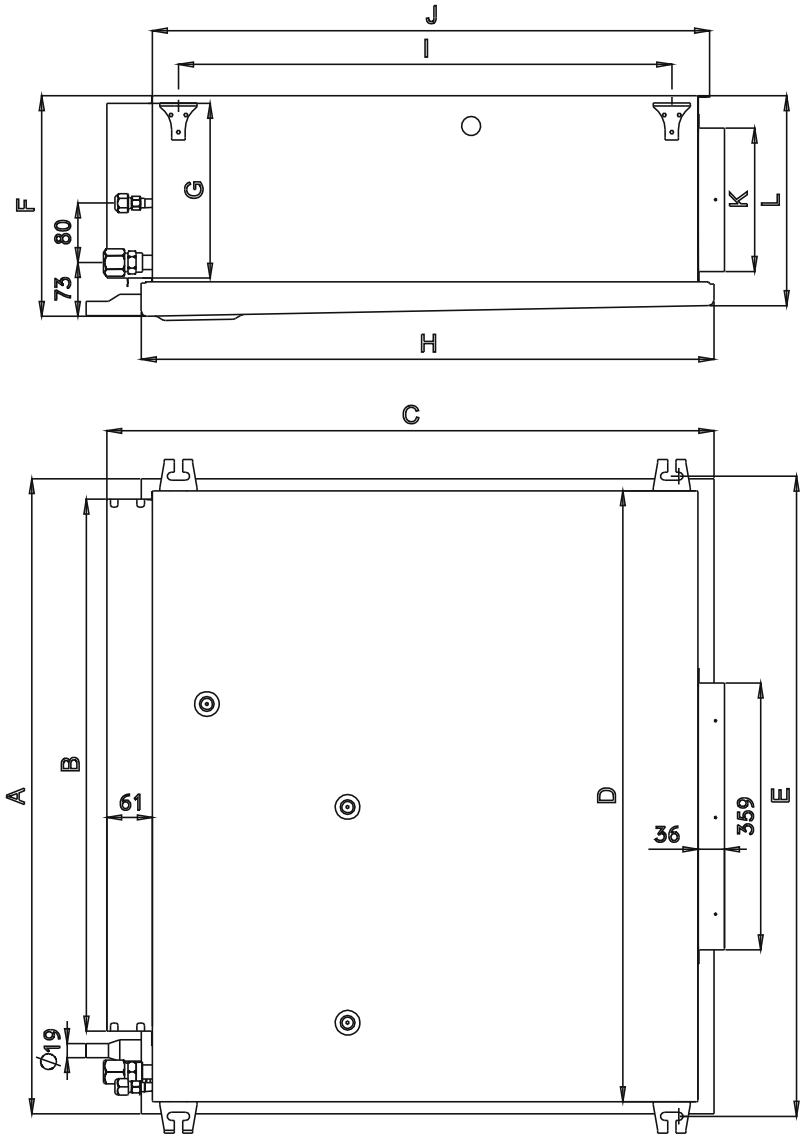
Heating:
Indoor: 20°C DB
Outdoor: 7°C DB 6°C WB

3.1 Operating Limits

		Indoor	Outdoor
Cooling	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	21°C DB
Heating	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	20°C DB	-9°C DB -10°C WB
Voltage	1PH	198 – 264V	
	3PH	360 – 440 V	

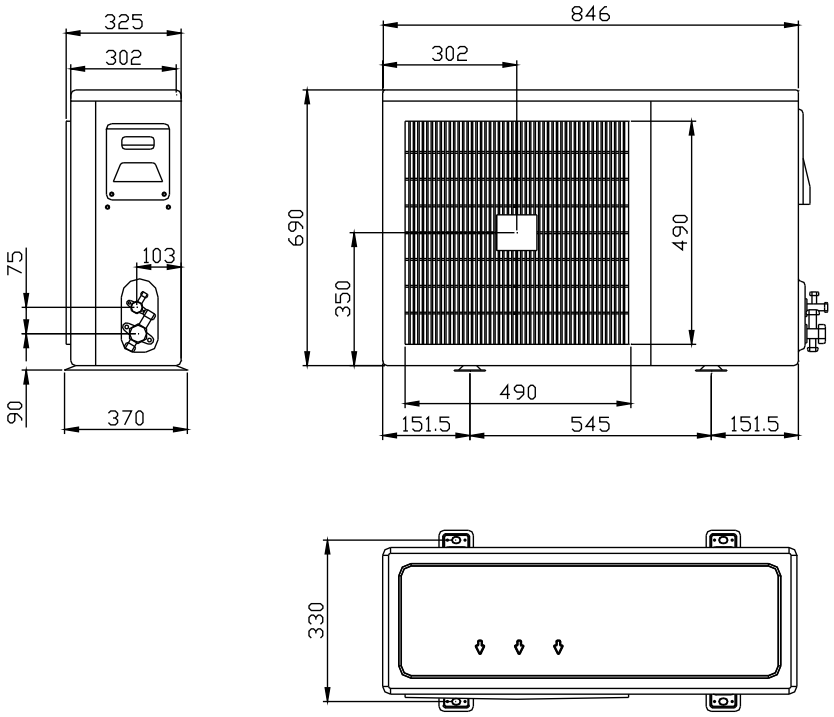
4. OUTLINE DIMENSIONS

4.1 Indoor Unit: DLS 18, 24, 30, 37, 44

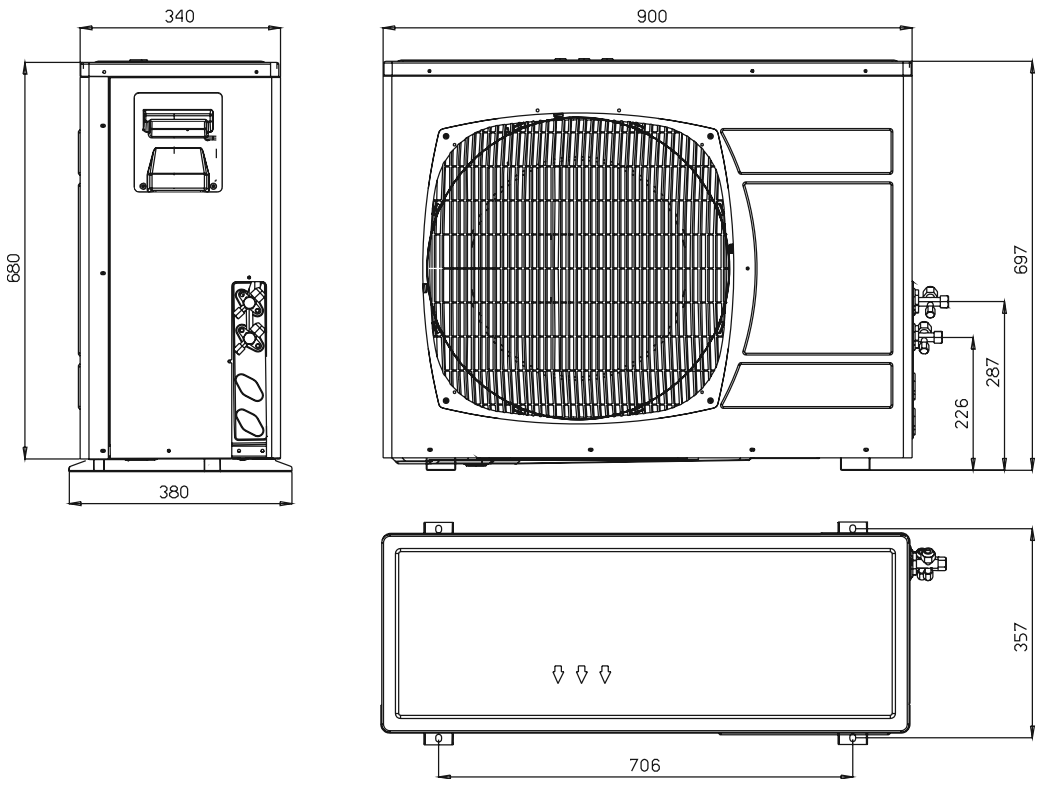


Model	A	B	C	D	E	F	G	H	I	J	K	L
DNG 18,24,30	790	653	749	758	797	256	195	702	599	684	162	242
DNG 37,44	854	715	816	822	861	297	235	770	663	749	193	282

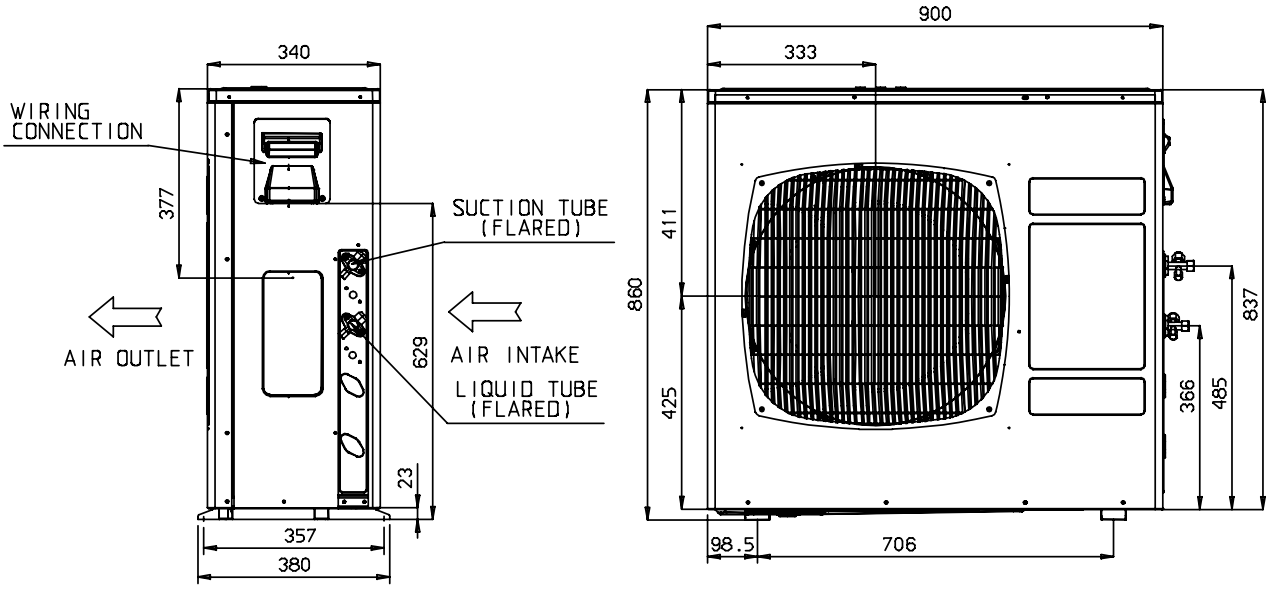
4.2 Outdoor Unit: GC 18



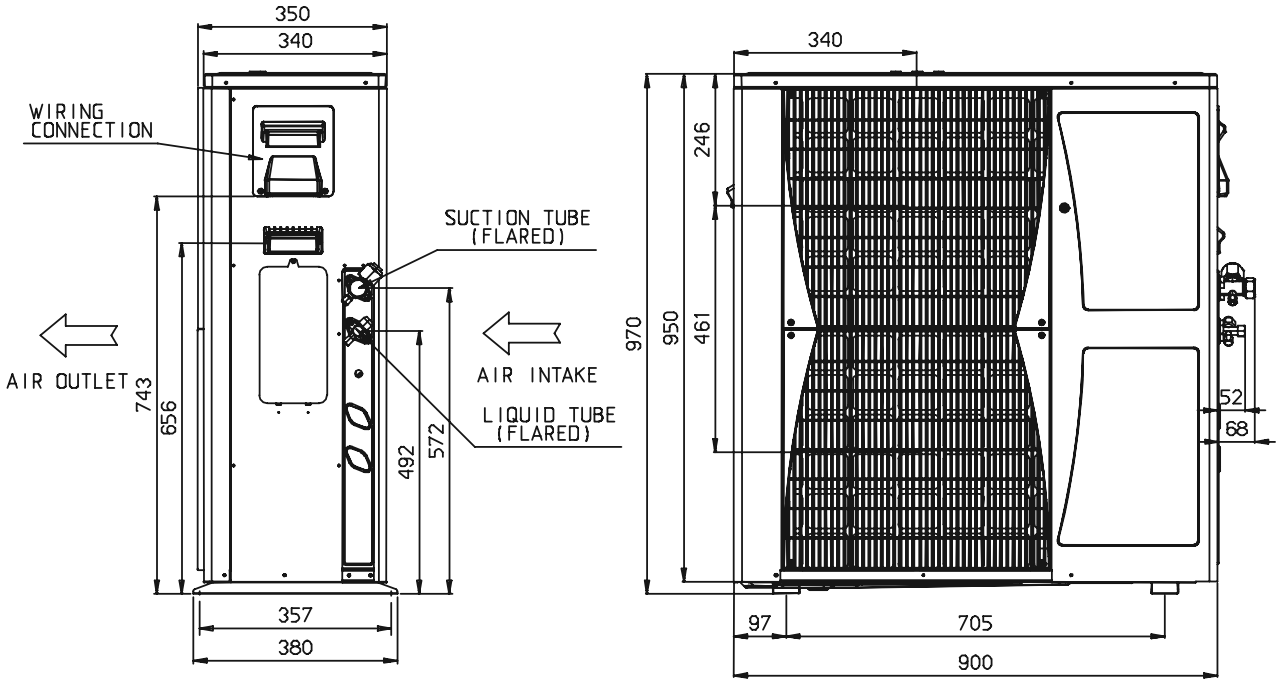
4.3 Outdoor Unit: GCN 24, GCN 24Z



4.4 Outdoor Unit: GCN 30



4.5 Outdoor Unit: GCN 37, 42, 40T



5. PERFORMANCE DATA & PRESSURE CURVES

5.1 DLS 18 / GC18 1PH / 3PH

5.1.1 Cooling Capacity (kW)

ENTERING AIR DB OU COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	5.90	6.11	6.26	6.41	6.50
	SC	3.82	3.98	4.14	4.24	4.32
	PI	1.28	1.28	1.28	1.28	1.29
20(1)	TC	5.71	6.02	6.21	6.36	6.49
	SC	3.74	3.95	4.11	4.23	4.31
	PI	1.39	1.39	1.39	1.40	1.41
25	TC	5.40	5.83	6.13	6.32	6.47
	SC	3.65	3.87	4.08	4.20	4.28
	PI	1.50	1.51	1.52	1.53	1.54
30	TC	5.05	5.50	5.94	6.16	6.34
	SC	3.53	3.75	3.99	4.11	4.19
	PI	1.62	1.64	1.65	1.67	1.68
35	TC	4.68	5.08	**5.60**	5.88	6.16
	SC	3.36	3.60	**3.90**	4.01	4.09
	PI	1.74	1.77	**1.80**	1.81	1.82
40	TC	4.25	4.63	5.05	5.53	5.81
	SC	3.17	3.41	3.69	3.81	3.88
	PI	1.88	1.91	1.94	1.96	1.98
46	TC	3.69	4.04	4.44	4.90	5.28
	SC	2.92	3.12	3.36	3.48	3.56
	PI	2.05	2.08	2.13	2.16	2.19

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 16).

5.1.2 Heating

ENTERING WB OD COIL(°C)	ENTERING AIR DB ID COIL(°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	3.06	1.36	2.94	1.45	2.83	1.52
-7	3.29	1.39	3.18	1.47	3.06	1.55
-2	3.50	1.41	3.38	1.50	3.26	1.58
2	4.26	1.48	4.08	1.57	3.91	1.67
6	5.46	1.59	**5.30**	**1.70**	5.11	1.81
10	5.94	1.68	5.78	1.79	5.62	1.92
15	6.41	1.75	6.25	1.89	6.10	2.01
20	6.76	1.80	6.60	1.96	6.41	2.11

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

5.2 Capacity Correction Factor Due to Tubing Length

5.2.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.97	0.96	0.95	0.94	---	---	---

* Minimum recommended tubing length between indoor and outdoor units is 3m.

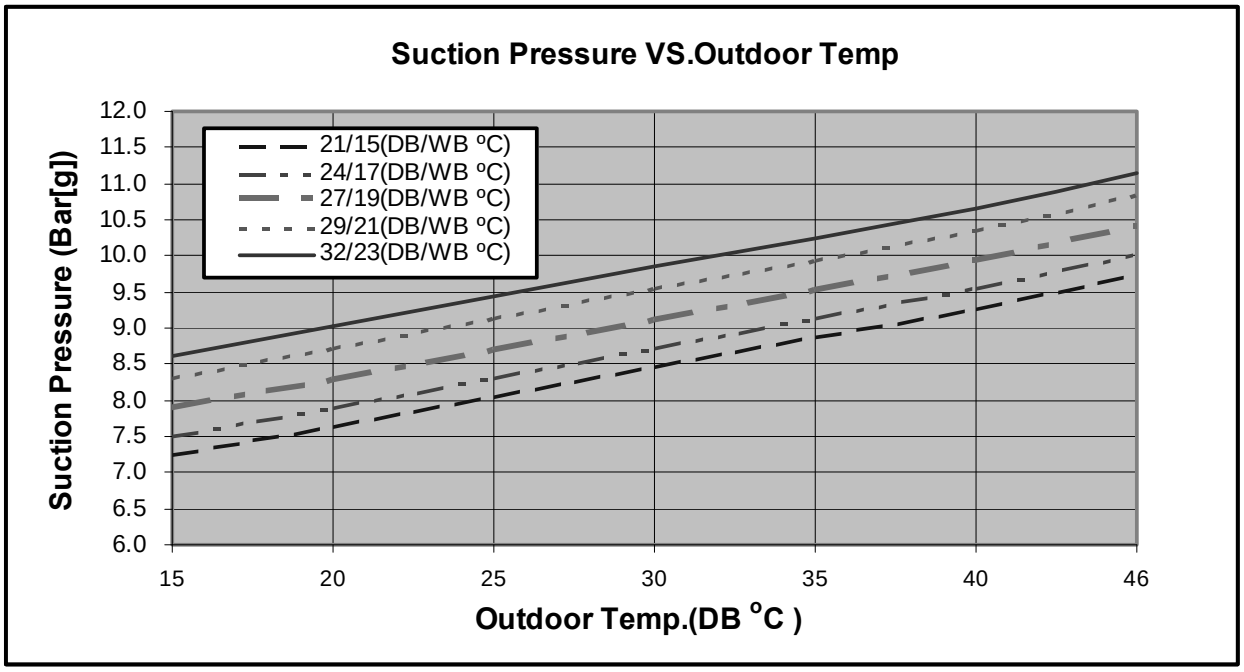
5.2.2 Heating

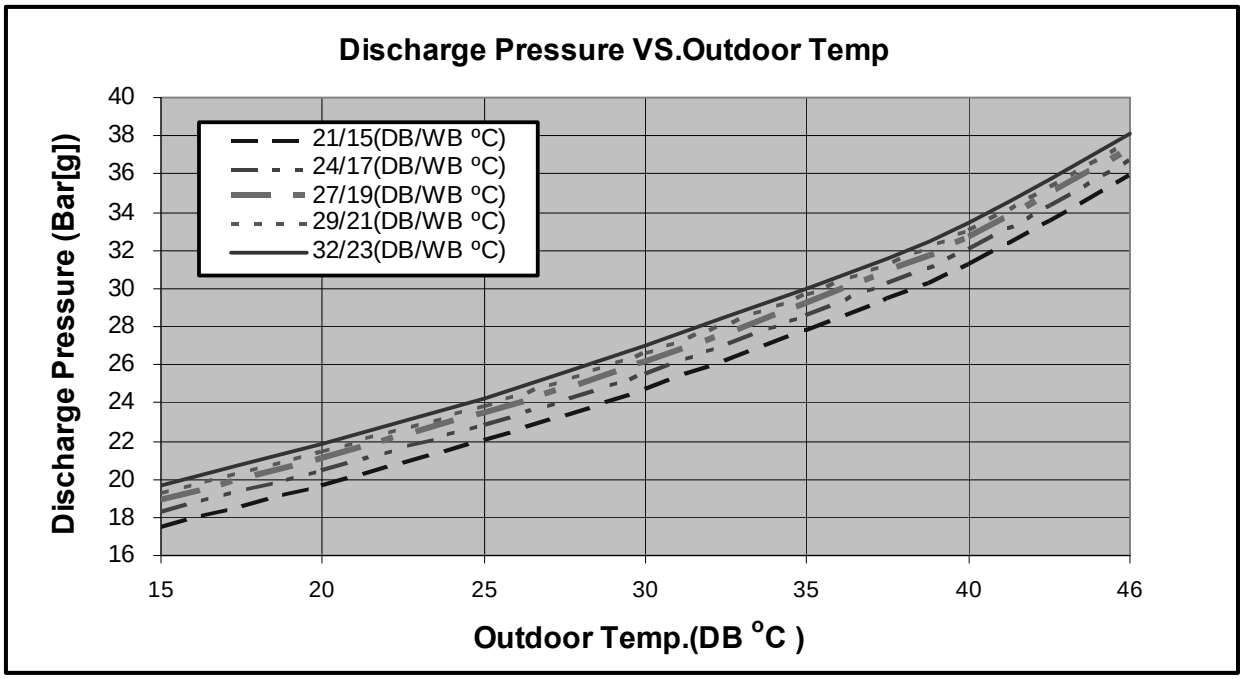
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.98	0.97	0.95	0.93	---	---	---

* Minimum recommended tubing length between indoor and outdoor units is 3m.

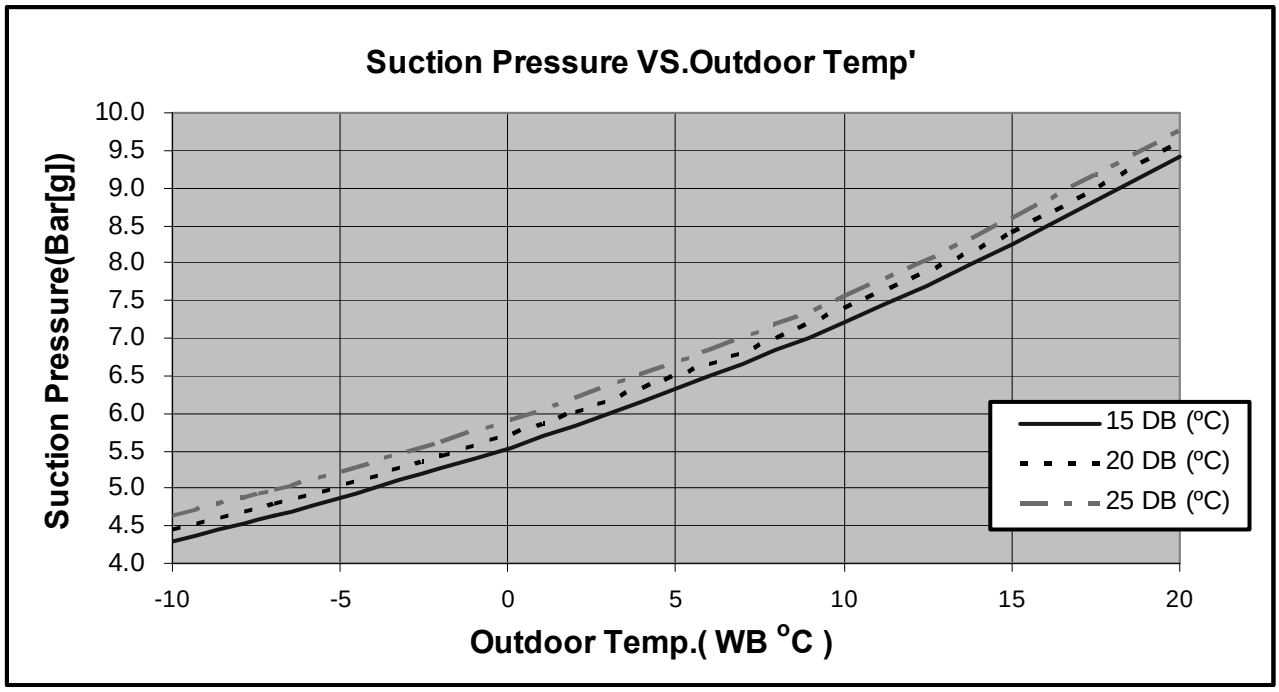
5.3 Pressure Curves

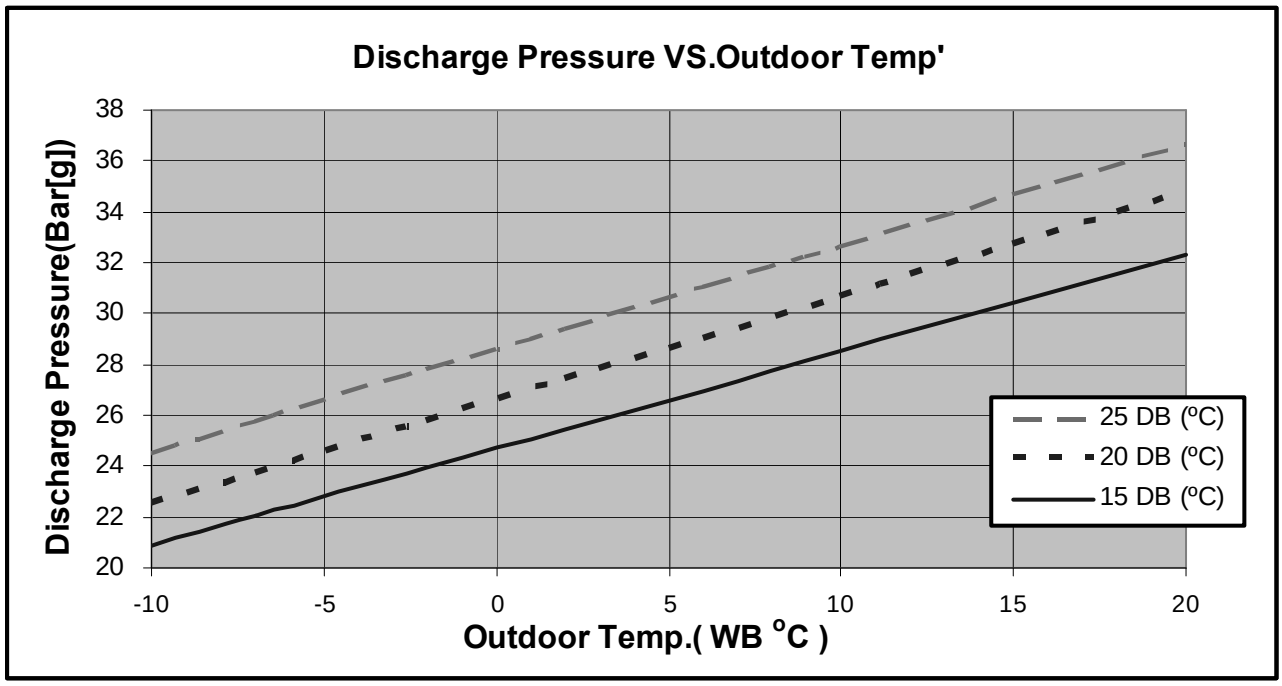
5.3.1 Cooling





5.3.2 Heating


Suction Pressure VS.Outdoor Temp'
Suction Pressure(Bar[g])
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
15 DB (ºC)
20 DB (ºC)
25 DB (ºC)


Discharge Pressure VS.Outdoor Temp'
Discharge Pressure(Bar[g])
38
36
34
32
30
28
26
24
22
20
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
25 DB (ºC)
20 DB (ºC)
15 DB (ºC)

5.4 DLS 24 / GCN 24, DLS 24 / GCN 24Z

5.4.1 Cooling Capacity (kW)

ENTERING AIR DB OU COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	7.27	7.53	7.71	7.89	8.01
	SC	5.24	5.46	5.68	5.82	5.93
	PI	1.70	1.71	1.71	1.71	1.72
20(1)	TC	7.04	7.42	7.65	7.83	8.00
	SC	5.13	5.41	5.64	5.80	5.91
	PI	1.85	1.85	1.86	1.87	1.87
25	TC	6.66	7.19	7.56	7.79	7.98
	SC	5.00	5.31	5.60	5.76	5.87
	PI	2.00	2.01	2.02	2.04	2.05
30	TC	6.23	6.78	7.32	7.58	7.81
	SC	4.85	5.15	5.48	5.64	5.74
	PI	2.15	2.19	2.20	2.22	2.24
35	TC	5.76	6.26	**6.90**	7.25	7.59
	SC	4.61	4.94	**5.35**	5.51	5.61
	PI	2.32	2.36	**2.40**	2.42	2.43
40	TC	5.24	5.71	6.23	6.81	7.16
	SC	4.34	4.67	5.06	5.22	5.33
	PI	2.51	2.54	2.59	2.62	2.65
46	TC	4.55	4.97	5.47	6.04	6.51
	SC	4.00	4.29	4.61	4.78	4.88
	PI	2.74	2.78	2.84	2.88	2.91

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 16).

5.4.2 Heating

ENTERING WB OD COIL(°C)	ENTERING AIR DB ID COIL(°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	4.04	1.84	3.89	1.96	3.73	2.06
-7	4.35	1.89	4.20	1.99	4.04	2.10
-2	4.62	1.91	4.47	2.02	4.31	2.14
2	5.62	2.00	5.39	2.13	5.16	2.25
6	7.21	2.15	**7.00**	**2.30**	6.76	2.44
10	7.84	2.27	7.63	2.43	7.42	2.59
15	8.47	2.37	8.26	2.55	8.05	2.71
20	8.93	2.44	8.72	2.65	8.47	2.85

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

5.5 Capacity Correction Factor Due to Tubing Length

5.5.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.98	0.97	0.96	0.95	0.94	0.93	0.9

* Minimum recommended tubing length between indoor and outdoor units is 3m.

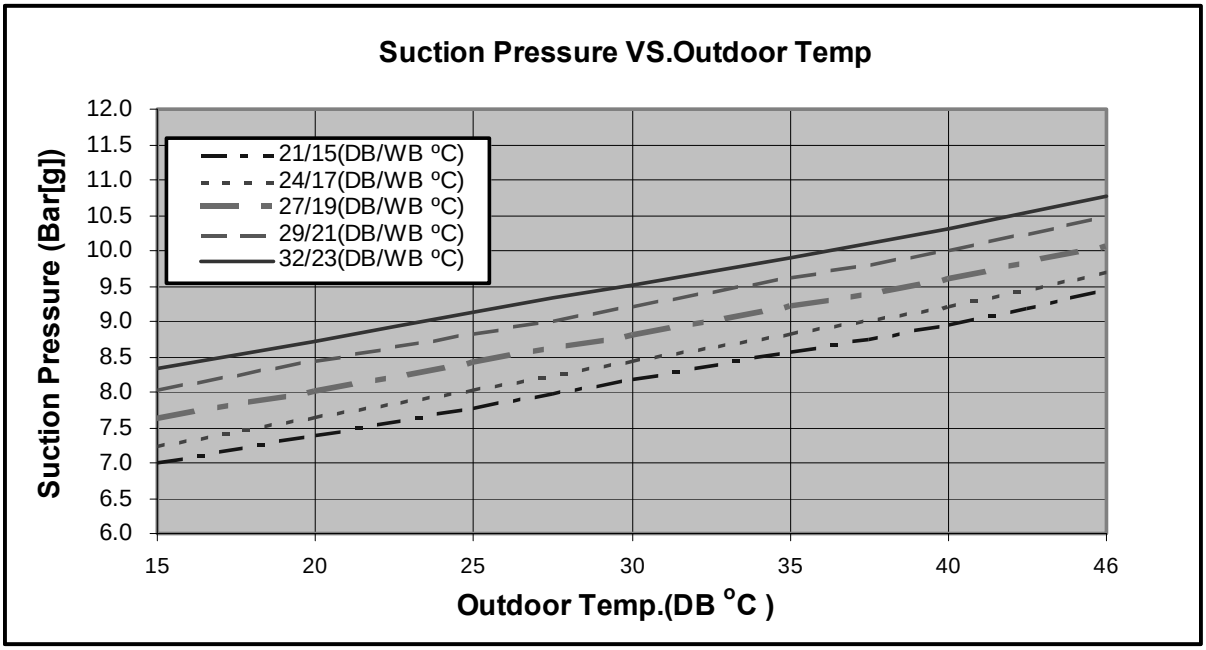
5.5.2 Heating

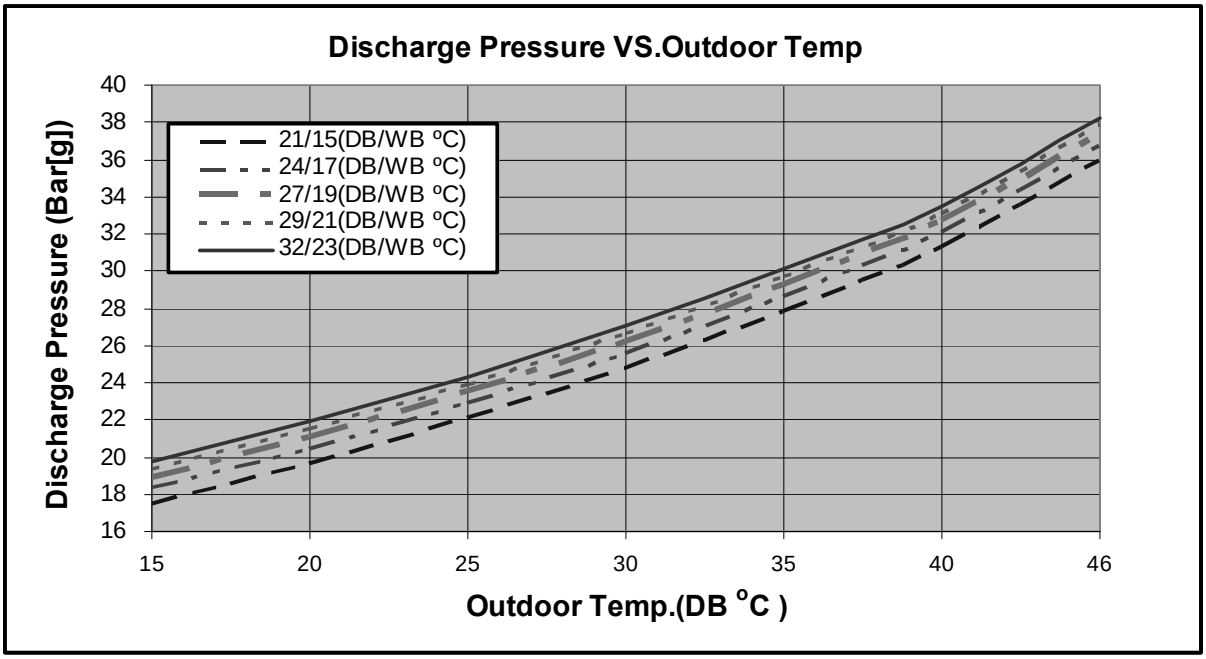
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.99	0.98	0.97	0.97	0.96	0.95

* Minimum recommended tubing length between indoor and outdoor units is 3m.

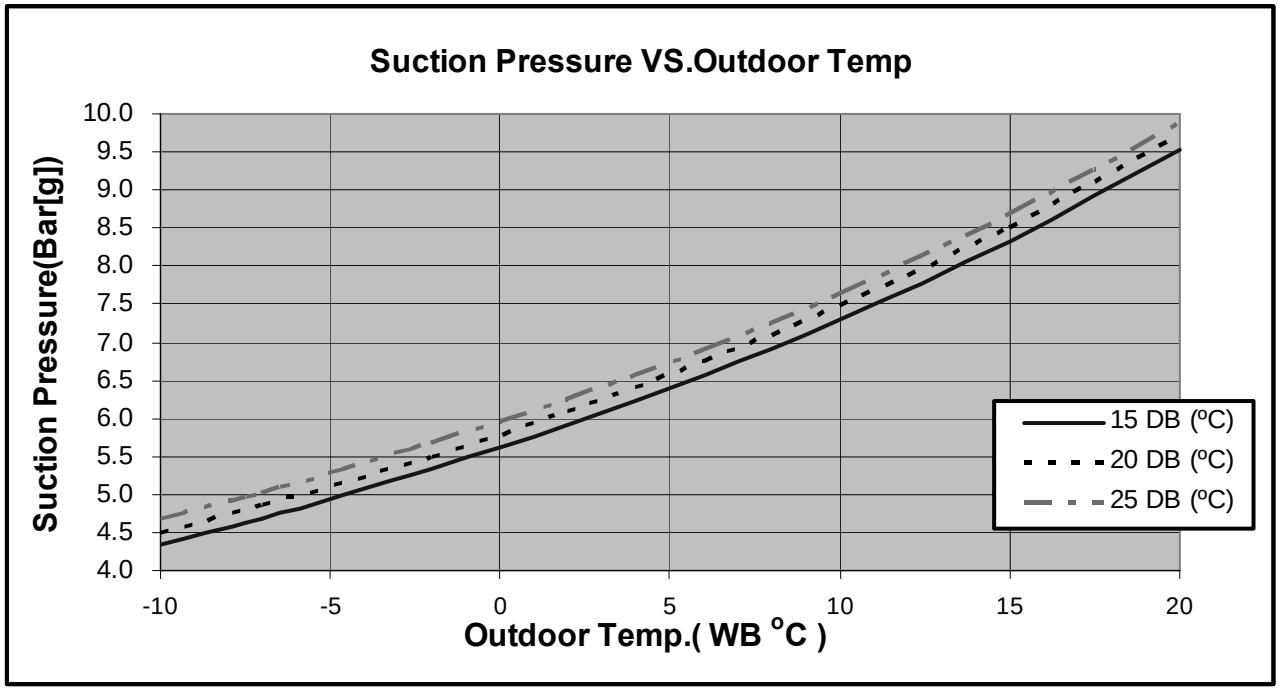
5.6 Pressure Curves

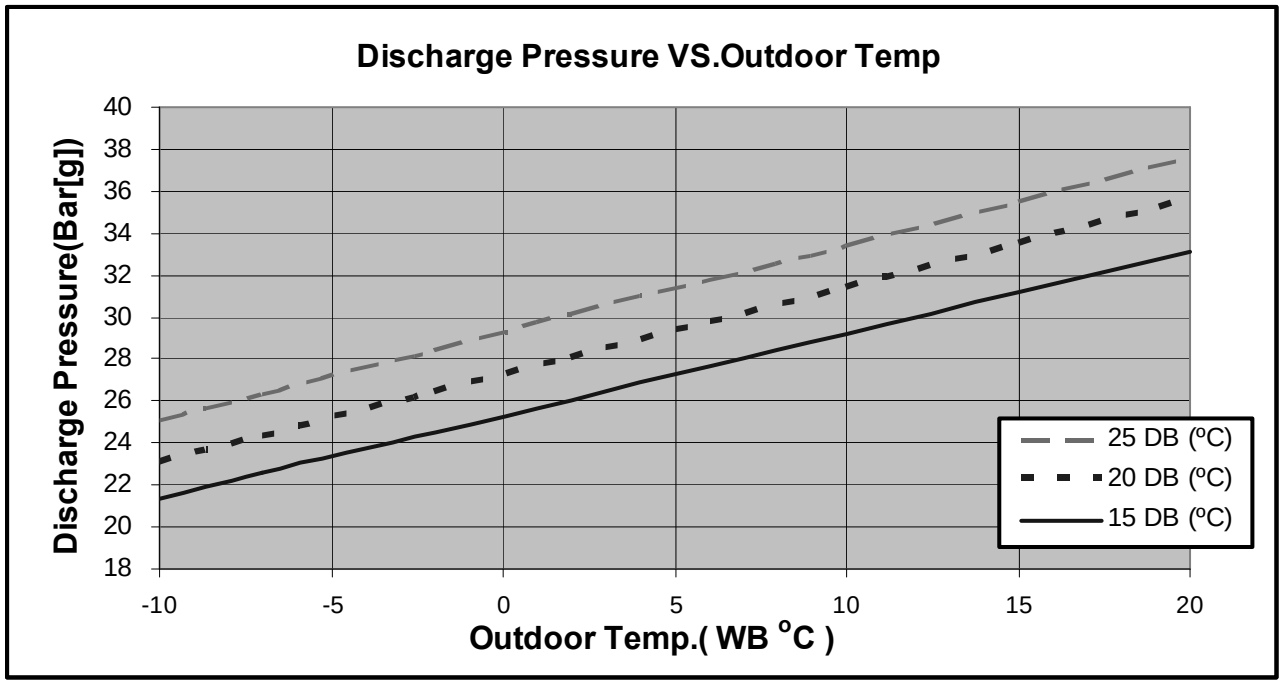
5.6.1 Cooling





5.6.2 Heating


Suction Pressure VS.Outdoor Temp
Suction Pressure(Bar[g])
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
15 DB (ºC)
20 DB (ºC)
25 DB (ºC)


Discharge Pressure VS.Outdoor Temp
Discharge Pressure(Bar[g])
40
38
36
34
32
30
28
26
24
22
20
18
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
25 DB (ºC)
20 DB (ºC)
15 DB (ºC)

5.7 DLS 30 / GCN 30 1PH / 3PH

5.7.1 Cooling Capacity (kW)

ENTERING AIR DB OU COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	8.96	9.28	9.50	9.72	9.87
	SC	6.36	6.63	6.89	7.06	7.19
	PI	2.13	2.13	2.14	2.14	2.15
20(1)	TC	8.67	9.14	9.42	9.65	9.86
	SC	6.23	6.57	6.84	7.04	7.17
	PI	2.31	2.32	2.32	2.34	2.34
25	TC	8.20	8.85	9.31	9.59	9.83
	SC	6.07	6.44	6.79	6.99	7.12
	PI	2.50	2.51	2.53	2.55	2.56
30	TC	7.67	8.35	9.02	9.34	9.62
	SC	5.88	6.25	6.64	6.84	6.97
	PI	2.69	2.73	2.75	2.78	2.80
35	TC	7.10	7.71	**8.50**	8.93	9.35
	SC	5.59	5.99	**6.49**	6.68	6.81
	PI	2.90	2.95	**3.00**	3.02	3.04
40	TC	6.46	7.03	7.67	8.39	8.82
	SC	5.27	5.67	6.14	6.33	6.46
	PI	3.13	3.18	3.23	3.27	3.31
46	TC	5.60	6.13	6.74	7.44	8.02
	SC	4.85	5.20	5.60	5.79	5.92
	PI	3.42	3.47	3.55	3.60	3.64

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 16).

5.7.2 Heating

ENTERING WB OD COIL(°C)	ENTERING AIR DB ID COIL(°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	5.20	2.24	5.00	2.39	4.80	2.51
-7	5.59	2.30	5.40	2.42	5.20	2.55
-2	5.94	2.32	5.74	2.46	5.54	2.60
2	7.23	2.44	6.93	2.59	6.63	2.74
6	9.27	2.62	**9.00**	**2.80**	8.69	2.97
10	10.08	2.76	9.81	2.95	9.54	3.16
15	10.89	2.88	10.62	3.11	10.35	3.30
20	11.48	2.97	11.21	3.22	10.89	3.47

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

5.8 Capacity Correction Factor Due to Tubing Length

5.8.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.98	0.97	0.96	0.95	0.94	0.93	0.9

* Minimum recommended tubing length between indoor and outdoor units is 3m.

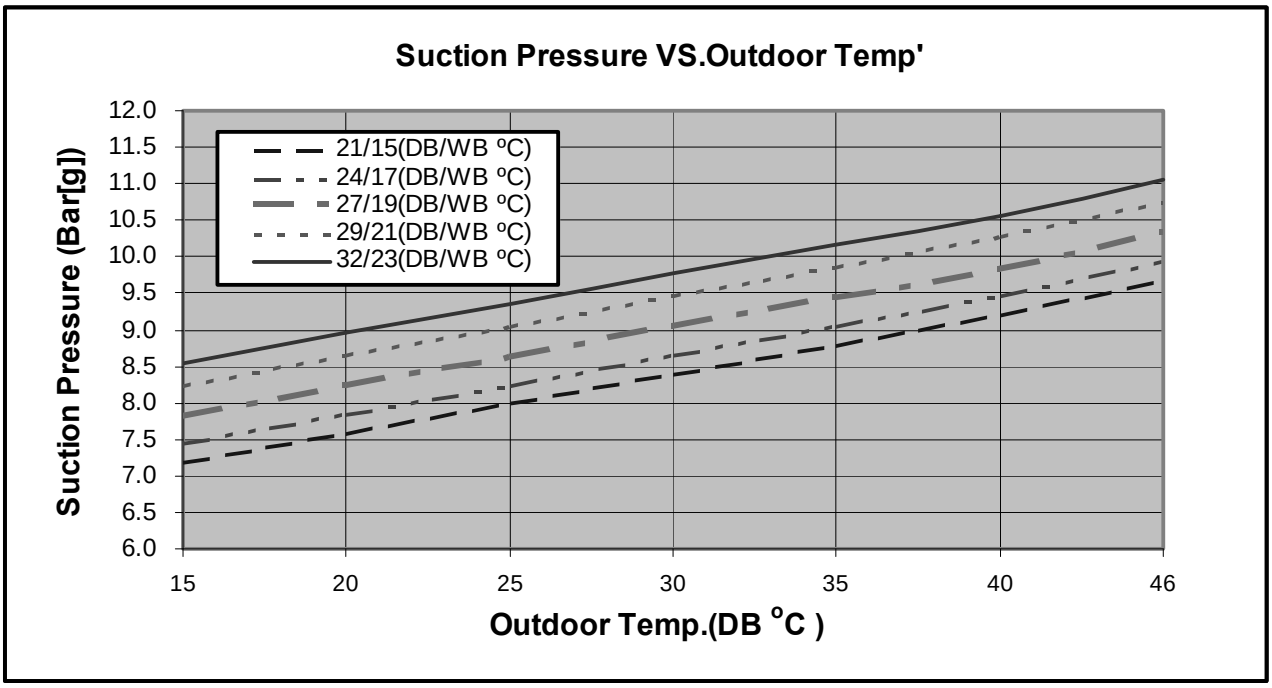
5.8.2 Heating

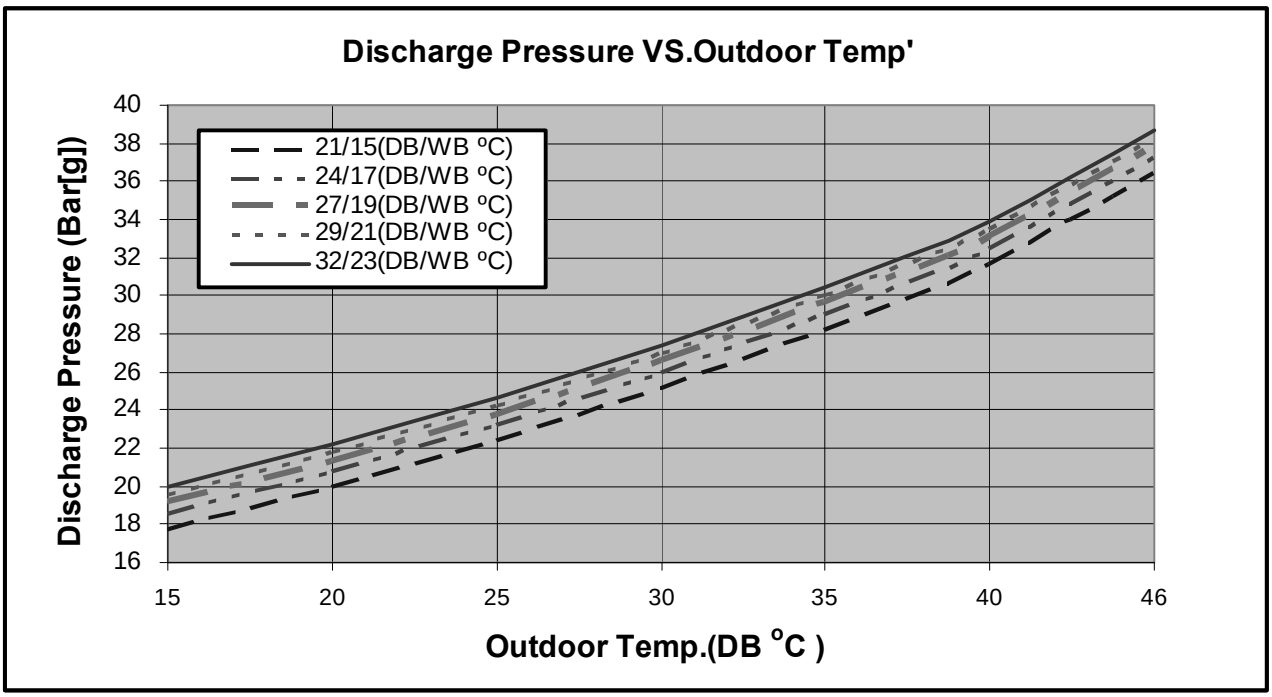
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.99	0.98	0.97	0.97	0.96	0.95

* Minimum recommended tubing length between indoor and outdoor units is 3m.

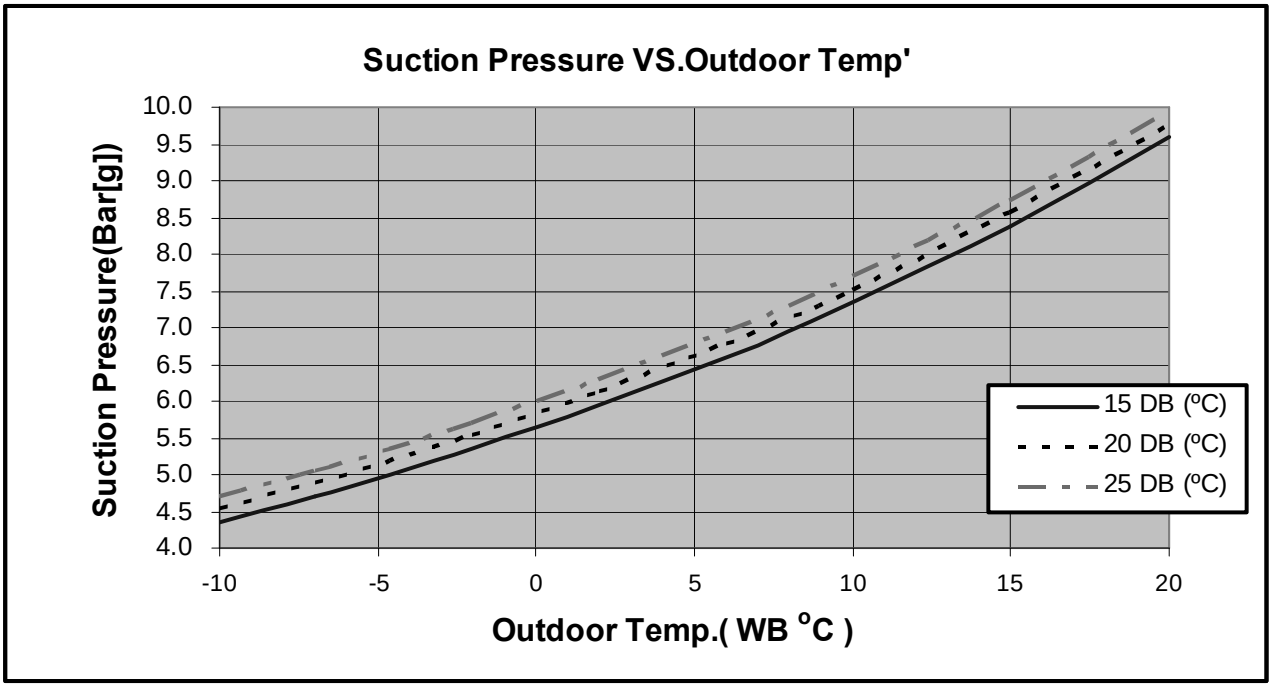
5.9 Pressure Curves

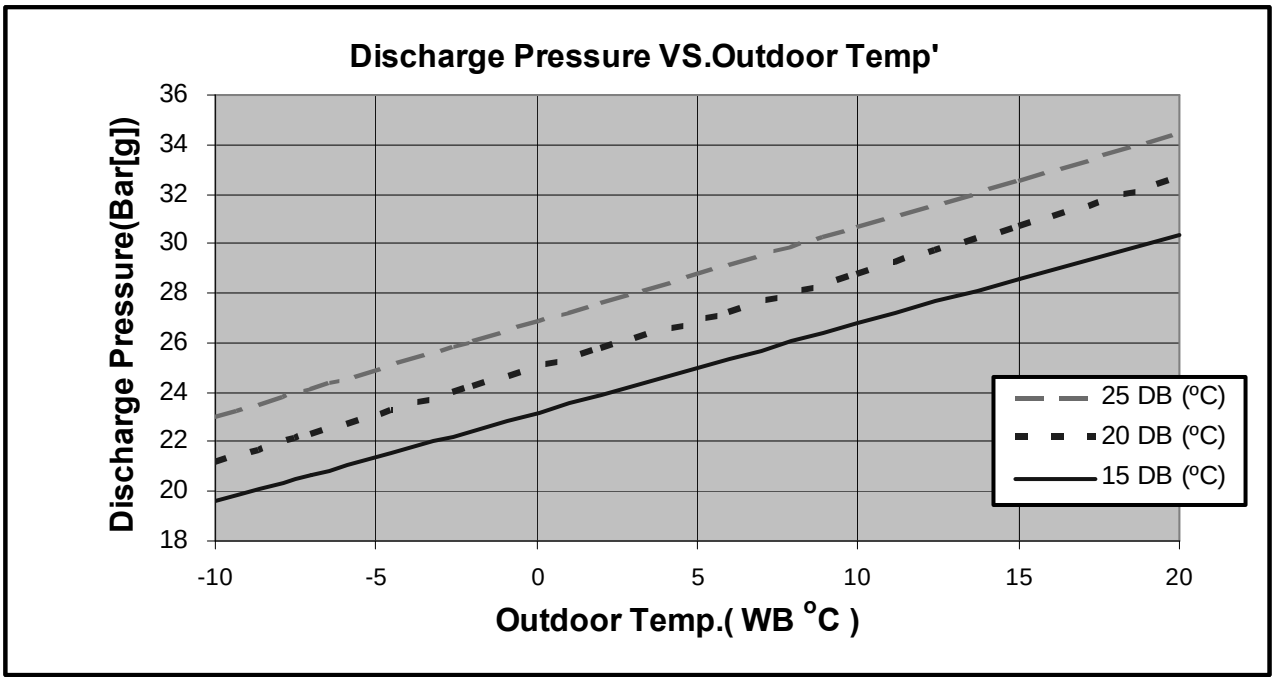
5.9.1 Cooling





5.9.2 Heating


Suction Pressure VS.Outdoor Temp'
Suction Pressure(Bar[g])
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
15 DB (ºC)
20 DB (ºC)
25 DB (ºC)


Discharge Pressure VS.Outdoor Temp'
Discharge Pressure(Bar[g])
36
34
32
30
28
26
24
22
20
18
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
25 DB (ºC)
20 DB (ºC)
15 DB (ºC)

5.10 DLS 37 / GCN 37 1PH

5.10.1 Cooling Capacity (kW)

ENTERING AIR DB OU COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	11.17	11.57	11.85	12.12	12.31
	SC	8.02	8.36	8.69	8.91	9.07
	PI	2.69	2.70	2.71	2.71	2.72
20(1)	TC	10.81	11.39	11.75	12.03	12.29
	SC	7.86	8.29	8.64	8.88	9.05
	PI	2.93	2.94	2.94	2.96	2.97
25	TC	10.23	11.04	11.61	11.96	12.25
	SC	7.66	8.13	8.57	8.82	8.98
	PI	3.16	3.18	3.20	3.23	3.25
30	TC	9.57	10.41	11.25	11.65	12.00
	SC	7.42	7.89	8.38	8.63	8.79
	PI	3.41	3.46	3.49	3.52	3.55
35	TC	8.86	9.61	**10.60**	11.13	11.66
	SC	7.05	7.56	**8.19**	8.43	8.59
	PI	3.68	3.74	**3.80**	3.83	3.85
40	TC	8.05	8.77	9.57	10.46	11.00
	SC	6.65	7.16	7.75	7.99	8.16
	PI	3.97	4.03	4.10	4.15	4.19
46	TC	6.99	7.64	8.40	9.28	10.00
	SC	6.12	6.56	7.06	7.31	7.47
	PI	4.33	4.40	4.50	4.56	4.61

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 16).

5.10.2 Heating

ENTERING WB OD COIL(°C)	ENTERING AIR DB ID COIL(°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	6.47	2.94	6.22	3.13	5.98	3.28
-7	6.96	3.01	6.71	3.17	6.47	3.35
-2	7.39	3.05	7.15	3.23	6.90	3.41
2	8.99	3.19	8.62	3.39	8.25	3.60
6	11.54	3.43	**11.20**	**3.67**	10.81	3.90
10	12.54	3.62	12.21	3.87	11.87	4.14
15	13.55	3.78	13.22	4.07	12.88	4.33
20	14.28	3.89	13.94	4.22	13.55	4.55

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

5.11 Capacity Correction Factor Due to Tubing Length

5.11.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.98	0.98	0.97	0.96	0.95	0.92

* Minimum recommended tubing length between indoor and outdoor units is 3m.

5.11.2 Heating

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.03	**1**	0.99	0.99	0.98	0.98	0.97	0.96	0.95

* Minimum recommended tubing length between indoor and outdoor units is 3m.

5.12 DLS 37 / GCN 37 3PH

5.12.1 Cooling Capacity (kW)

ENTERING AIR DB OU COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15(1)	TC	10.96	11.35	11.62	11.90	12.08
	SC	7.87	8.21	8.53	8.74	8.91
	PI	2.60	2.61	2.61	2.62	2.63
20(1)	TC	10.61	11.18	11.53	11.80	12.06
	SC	7.72	8.13	8.48	8.72	8.88
	PI	2.83	2.83	2.84	2.86	2.86
25	TC	10.03	10.83	11.39	11.74	12.02
	SC	7.52	7.98	8.41	8.66	8.82
	PI	3.05	3.07	3.09	3.11	3.14
30	TC	9.38	10.22	11.04	11.43	11.77
	SC	7.28	7.74	8.23	8.47	8.63
	PI	3.29	3.34	3.37	3.40	3.43
35	TC	8.69	9.43	**10.40**	10.92	11.44
	SC	6.92	7.42	**8.04**	8.27	8.43
	PI	3.55	3.61	**3.67**	3.70	3.72
40	TC	7.90	8.60	9.38	10.26	10.79
	SC	6.53	7.03	7.61	7.85	8.01
	PI	3.83	3.89	3.96	4.01	4.05
46	TC	6.85	7.49	8.24	9.11	9.81
	SC	6.01	6.44	6.94	7.18	7.34
	PI	4.19	4.25	4.35	4.41	4.46

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 16).

5.12.2 Heating

ENTERING WB OD COIL(°C)	ENTERING AIR DB ID COIL(°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	6.41	2.86	6.17	3.05	5.92	3.20
-7	6.90	2.94	6.65	3.10	6.41	3.26
-2	7.33	2.97	7.08	3.15	6.84	3.33
2	8.91	3.11	8.55	3.31	8.18	3.51
6	11.43	3.35	**11.10**	**3.58**	10.71	3.80
10	12.43	3.53	12.10	3.78	11.77	4.04
15	13.43	3.69	13.10	3.97	12.77	4.22
20	14.15	3.79	13.82	4.12	13.43	4.44

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

5.13 Capacity Correction Factor Due to Tubing Length

5.13.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.98	0.98	0.97	0.96	0.95	0.92

* Minimum recommended tubing length between indoor and outdoor units is 3m.

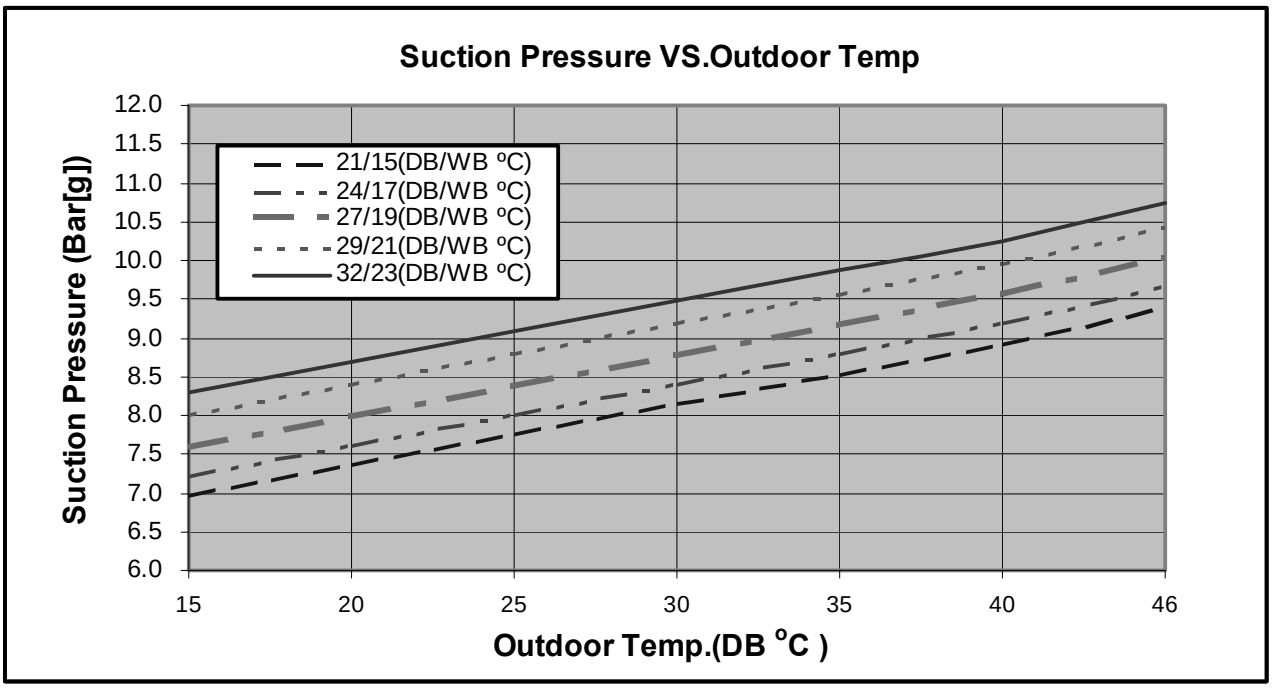
5.13.2 Heating

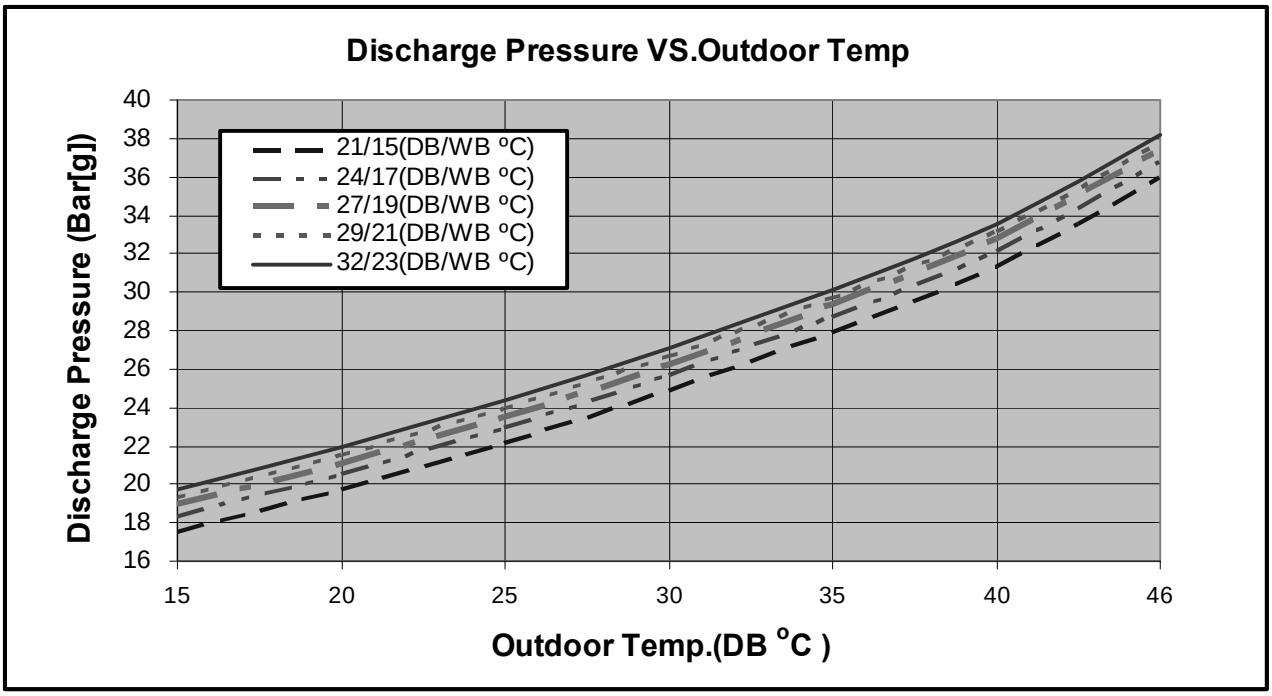
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.03	**1**	0.99	0.99	0.98	0.98	0.97	0.96	0.95

* Minimum recommended tubing length between indoor and outdoor units is 3m.

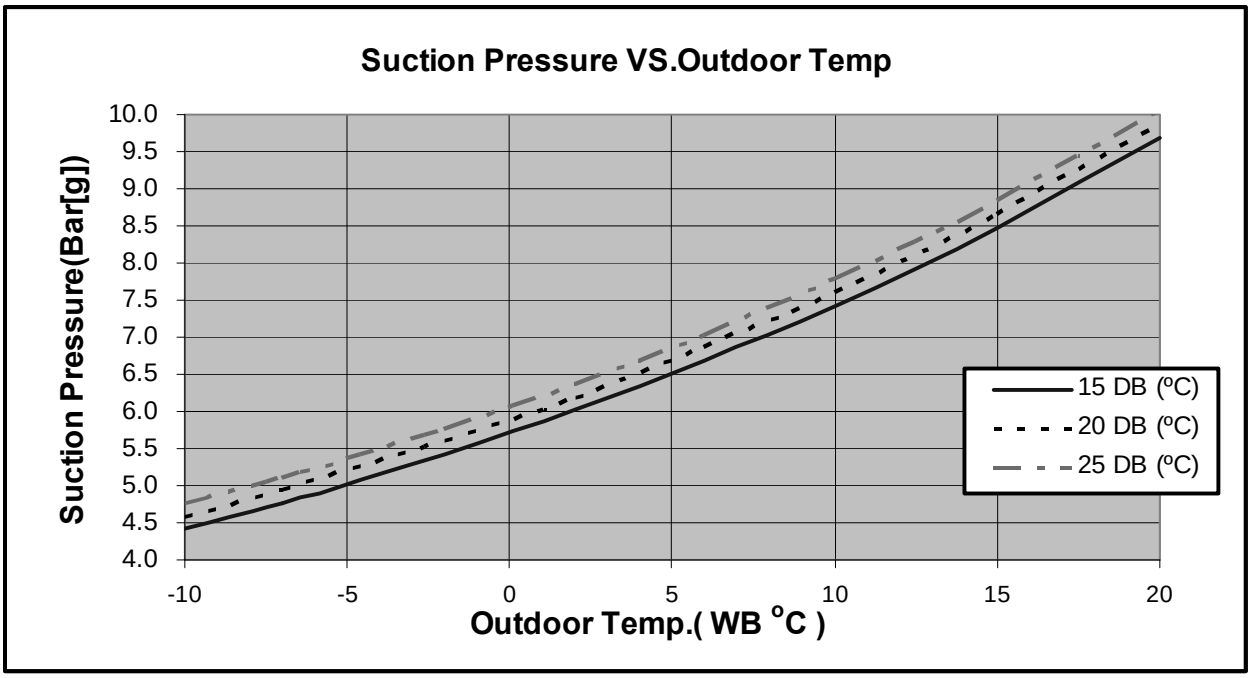
5.14 Pressure Curves – DLS 37 1PH/3PH

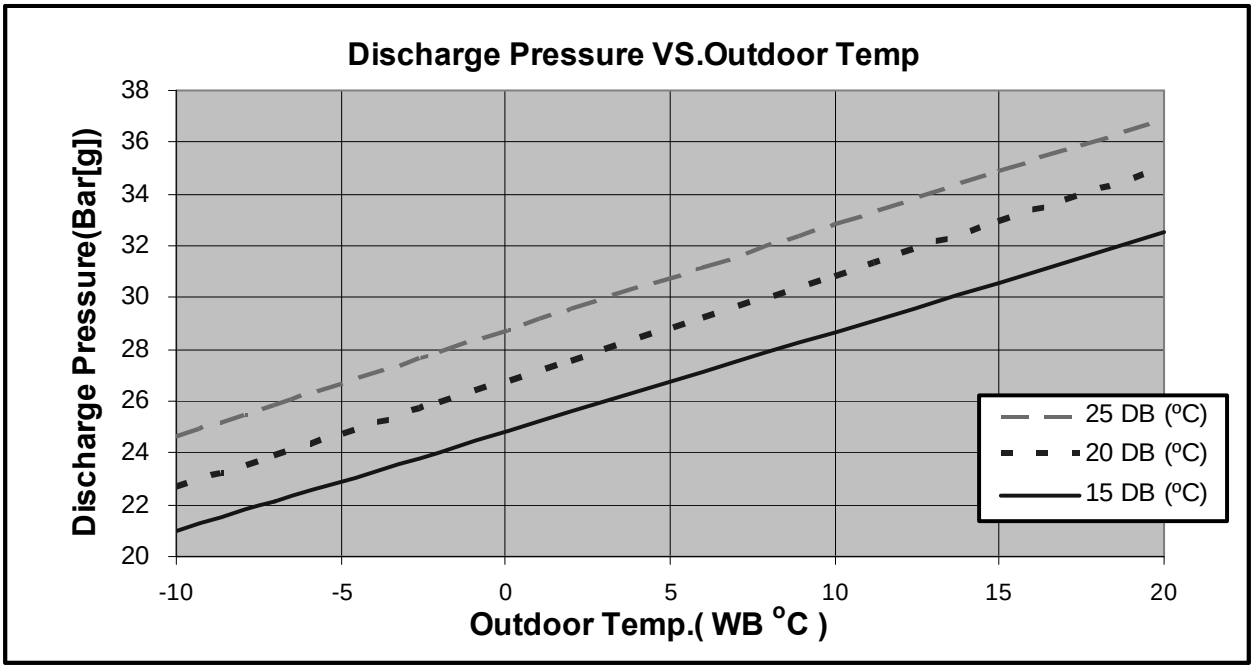
5.14.1 Cooling





5.14.2 Heating





5.15 DLS 44 / GCN 42 R410A

5.15.1 Cooling Capacity (kW)

Entering Air DB OD Coil (°C)	Data	Entering Air WB/DB ID Coil(°C)				
		15/21	17/24	19/27	21/29	23/32
15 (1)	TC	12.86	13.32	13.63	13.96	14.17
	SC	8.70	9.07	9.42	9.66	9.84
	PI	3.08	3.08	3.09	3.10	3.11
20 (1)	TC	12.44	13.11	13.53	13.85	14.15
	SC	8.52	8.98	9.36	9.63	9.81
	PI	3.34	3.35	3.36	3.38	3.39
25	TC	11.77	12.71	13.36	13.77	14.10
	SC	8.31	8.81	9.29	9.56	9.74
	PI	3.61	3.64	3.66	3.68	3.71
30	TC	11.01	11.99	12.95	13.41	13.81
	SC	8.04	8.55	9.09	9.36	9.53
	PI	3.89	3.95	3.99	4.02	4.05
35	TC	10.19	11.06	**12.20**	12.81	13.42
	SC	7.65	8.20	**8.88**	9.14	9.32
	PI	4.20	4.27	**4.34**	4.37	4.40
40	TC	9.27	10.09	11.01	12.04	12.66
	SC	7.21	7.76	8.40	8.67	8.84
	PI	4.53	4.60	4.68	4.74	4.78
46	TC	8.04	8.79	9.67	10.68	11.51
	SC	6.64	7.11	7.66	7.93	8.10
	PI	4.95	5.02	5.14	5.21	5.27

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 16).

5.15.2 Heating

ENTERING WB OD COIL(°C)	ENTERING AIR DB ID COIL(°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	6.88	3.50	6.62	3.72	6.35	3.91
-7	7.40	3.58	7.14	3.78	6.88	3.99
-2	7.86	3.63	7.60	3.85	7.34	4.06
2	9.56	3.80	9.17	4.04	8.78	4.28
6	13.49	4.09	**13.10**	**4.37**	12.64	4.64
10	14.67	4.31	14.28	4.61	13.89	4.93
15	15.85	4.50	15.46	4.85	15.07	5.16
20	16.70	4.63	16.31	5.03	15.85	5.42

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

5.16 Capacity Correction Factor Due to Tubing Length

5.16.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.98	0.97	0.96	0.95	0.94	0.93	0.9

* Minimum recommended tubing length between indoor and outdoor units is 3m.

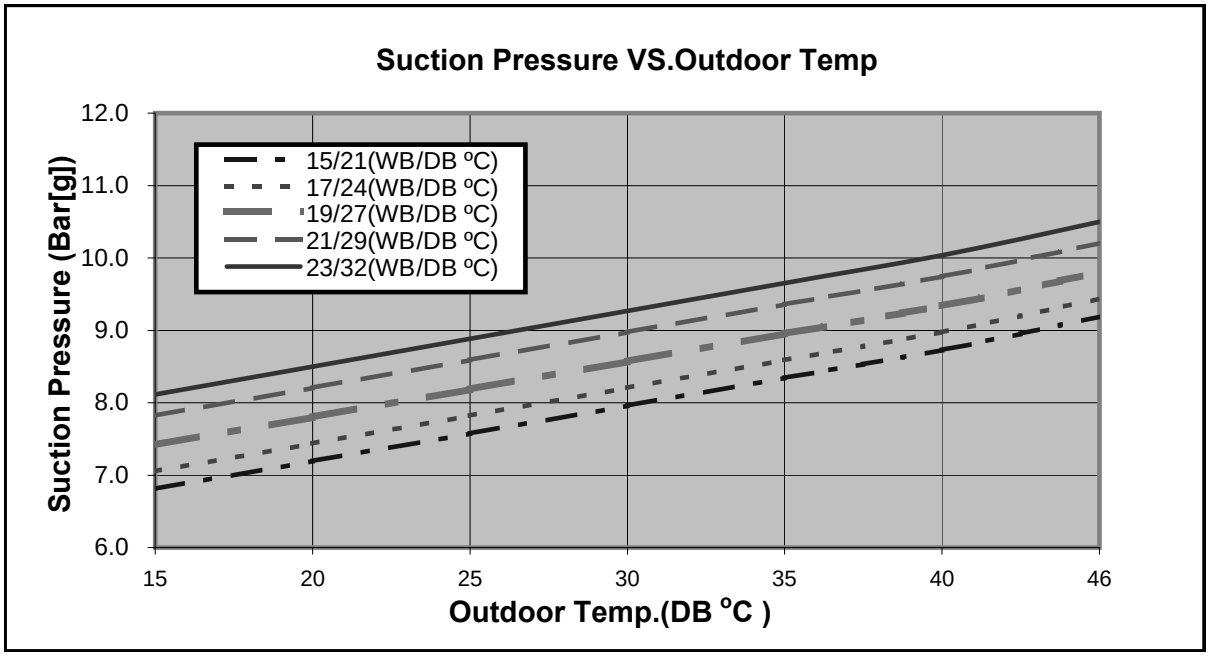
5.16.2 Heating

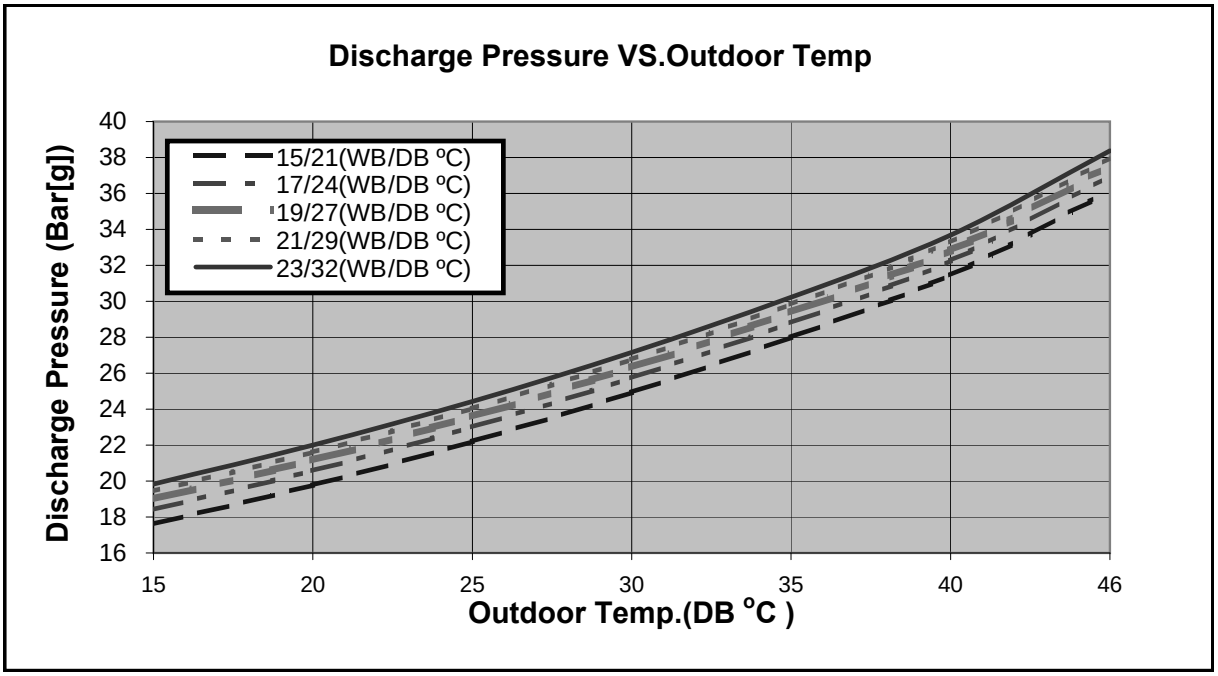
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.99	0.98	0.97	0.97	0.96	0.95

* Minimum recommended tubing length between indoor and outdoor units is 3m.

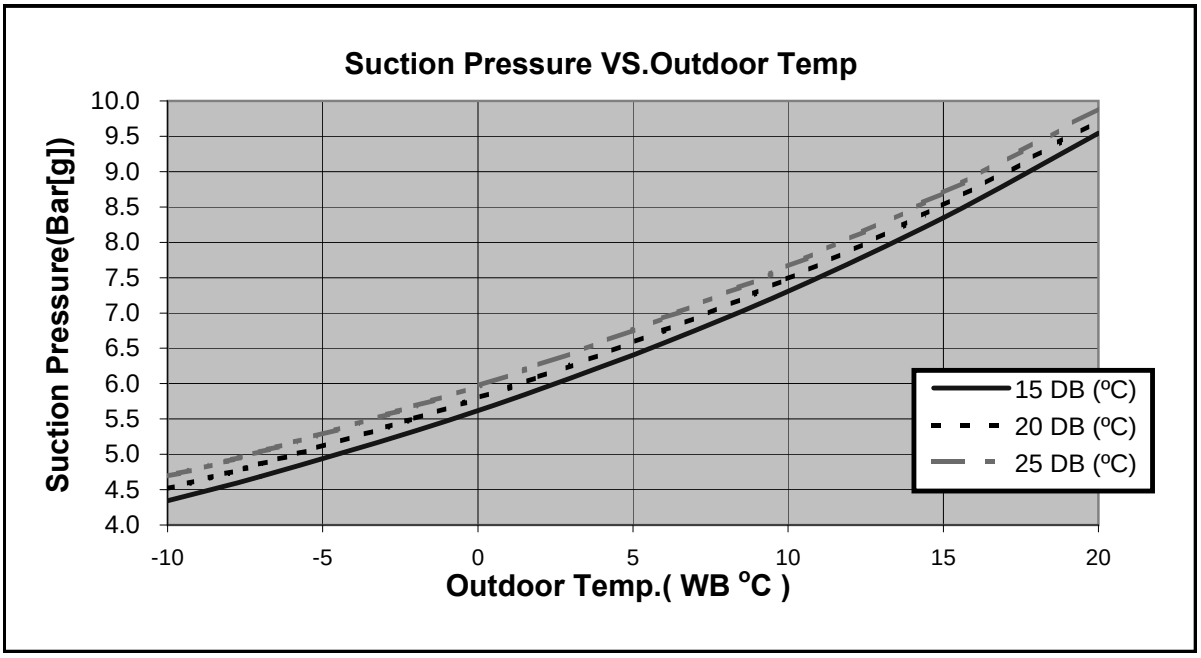
5.17 Pressure Curves

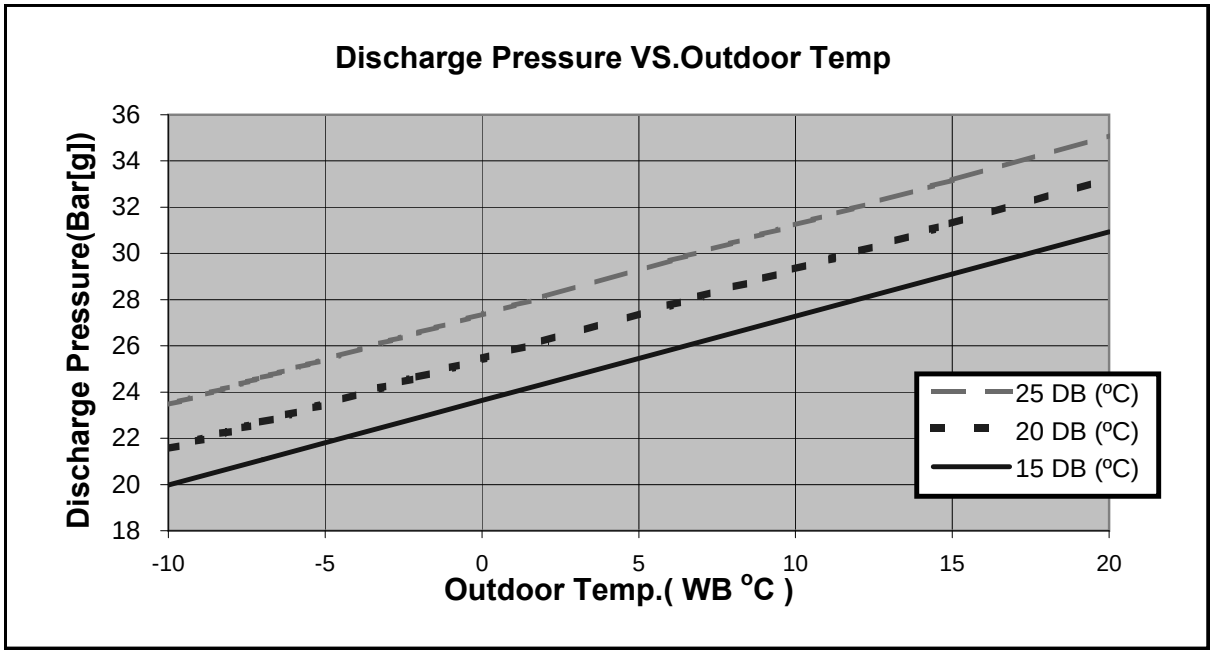
5.17.1 Cooling





5.17.2 Heating





5.18 DLS 44 / GCN 40T

5.18.1 Cooling Capacity (kW)

Entering Air DB OD Coil °C)	Data	Entering Air WB/DB ID Coil(°C)				
		15/21	17/24	19/27	21/29	23/32
15 (1)	TC	13.28	13.75	14.08	14.41	14.63
	SC	9.05	9.44	9.80	10.05	10.23
	PI	3.31	3.32	3.32	3.33	3.35
20 (1)	TC	12.85	13.54	13.97	14.30	14.61
	SC	8.87	9.35	9.74	10.02	10.21
	PI	3.60	3.61	3.62	3.64	3.65
25	TC	12.16	13.13	13.80	14.22	14.56
	SC	8.64	9.17	9.67	9.95	10.13
	PI	3.88	3.91	3.94	3.96	3.99
30	TC	11.37	12.38	13.37	13.85	14.26
	SC	8.37	8.90	9.46	9.74	9.92
	PI	4.19	4.25	4.29	4.32	4.36
35	TC	10.53	11.42	**12.60**	13.23	13.86
	SC	7.96	8.53	**9.24**	9.51	9.69
	PI	4.52	4.60	**4.67**	4.71	4.73
40	TC	9.57	10.42	11.37	12.43	13.07
	SC	7.50	8.07	8.74	9.02	9.20
	PI	4.88	4.95	5.03	5.10	5.15
46	TC	8.30	9.08	9.99	11.03	11.89
	SC	6.91	7.40	7.97	8.25	8.43
	PI	5.33	5.41	5.53	5.61	5.67

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 16).

5.18.2 Heating

ENTERING WB OD COIL(°C)	ENTERING AIR DB ID COIL(°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	7.46	3.78	7.17	4.03	6.89	4.23
-7	8.02	3.88	7.74	4.09	7.46	4.31
-2	8.52	3.93	8.24	4.16	7.95	4.40
2	10.37	4.12	9.94	4.38	9.51	4.64
6	14.63	4.42	**14.20**	**4.73**	13.70	5.02
10	15.90	4.67	15.48	4.99	15.05	5.34
15	17.18	4.87	16.76	5.25	16.33	5.58
20	18.11	5.01	17.68	5.44	17.18	5.87

LEGEND

TH – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

5.19 Capacity Correction Factor Due to Tubing Length

5.19.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.98	0.98	0.97	0.96	0.95	0.92

***** Minimum recommended tubing length between indoor and outdoor units is 3m.

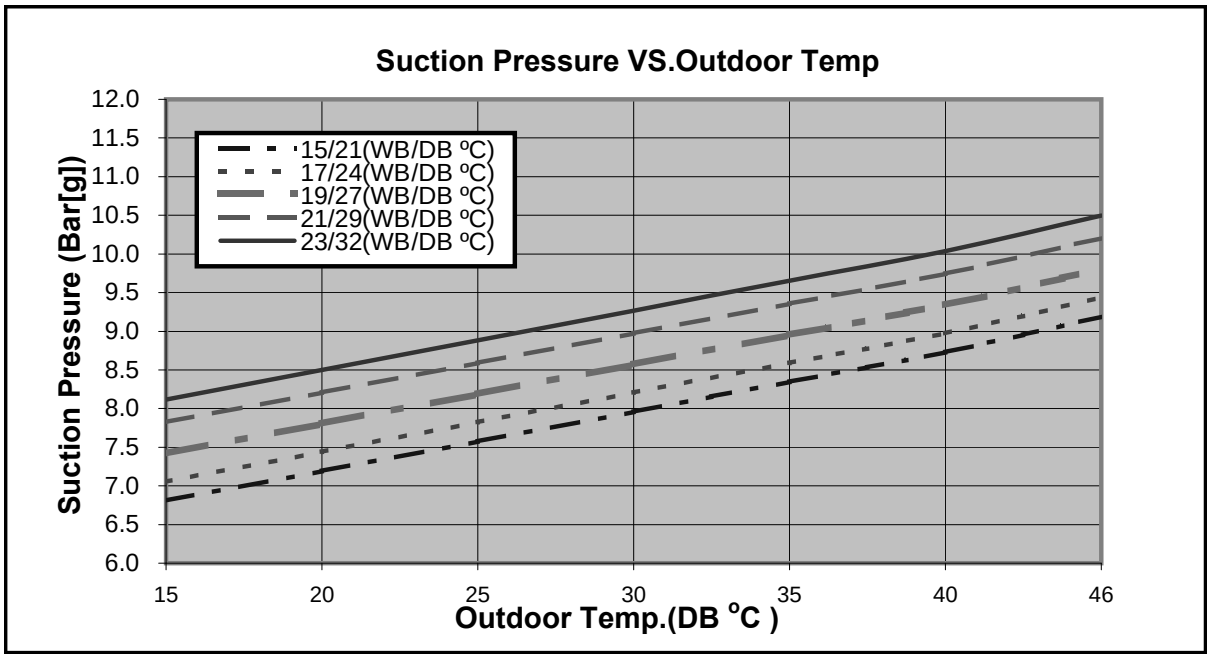
5.19.2 Heating

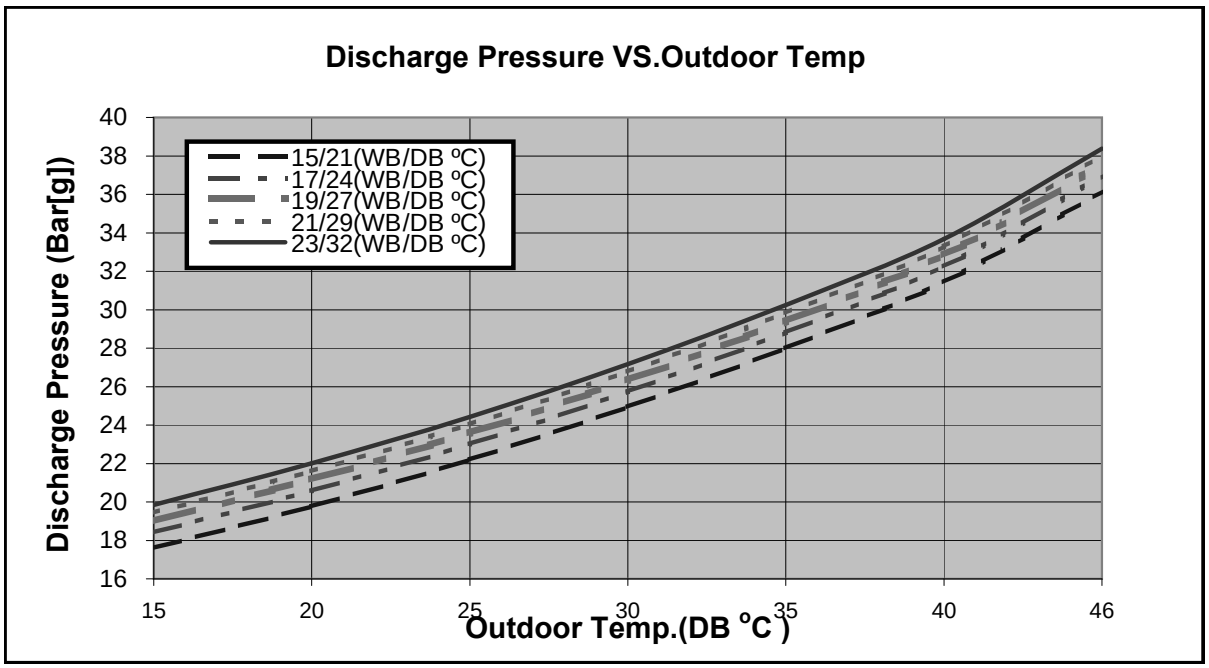
TOTAL TUBING LENGTH(One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.03	**1**	0.99	0.99	0.98	0.98	0.97	0.96	0.95

***** Minimum recommended tubing length between indoor and outdoor units is 3m.

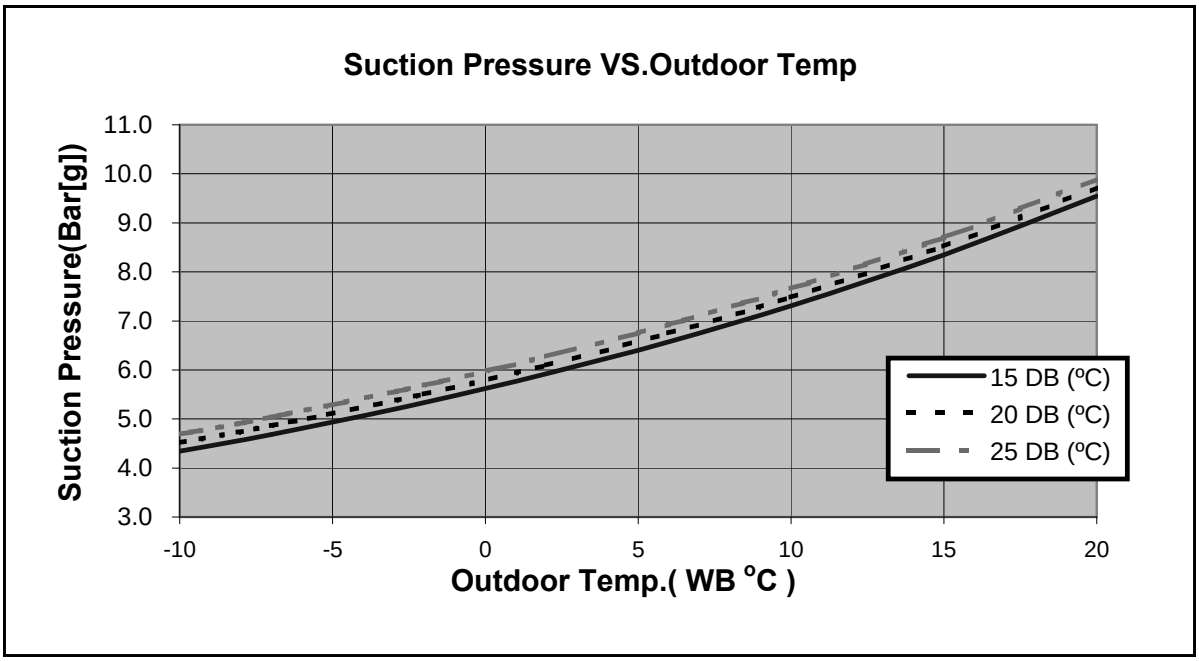
5.20 Pressure Curves

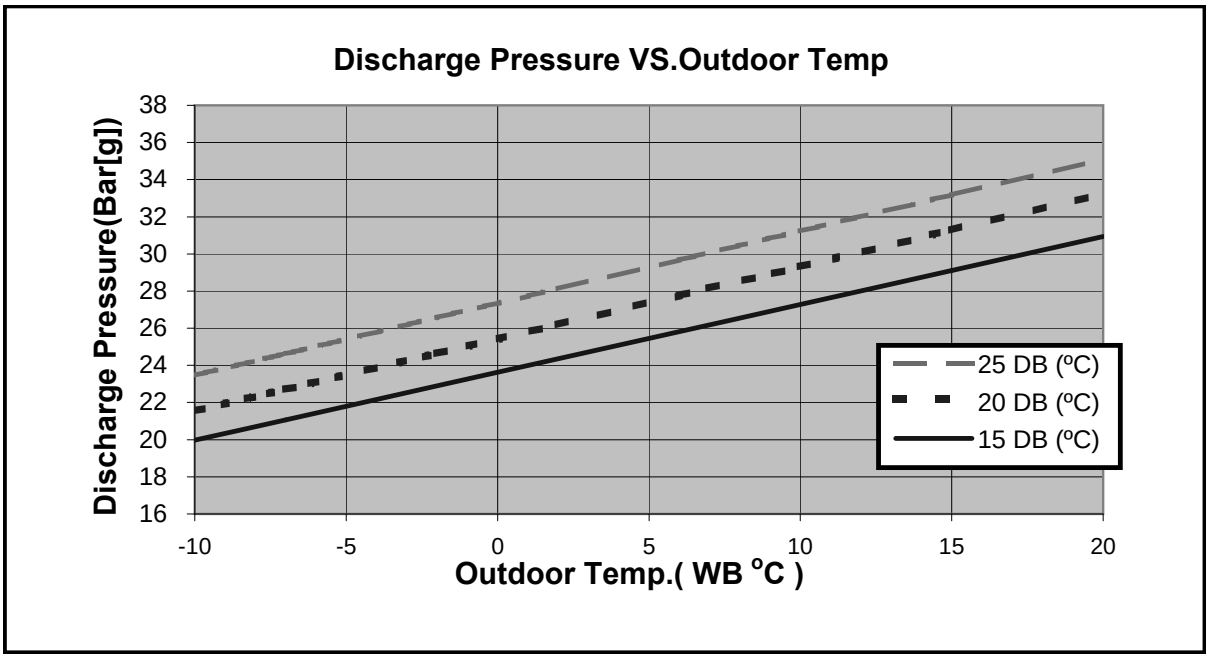
5.20.1 Cooling





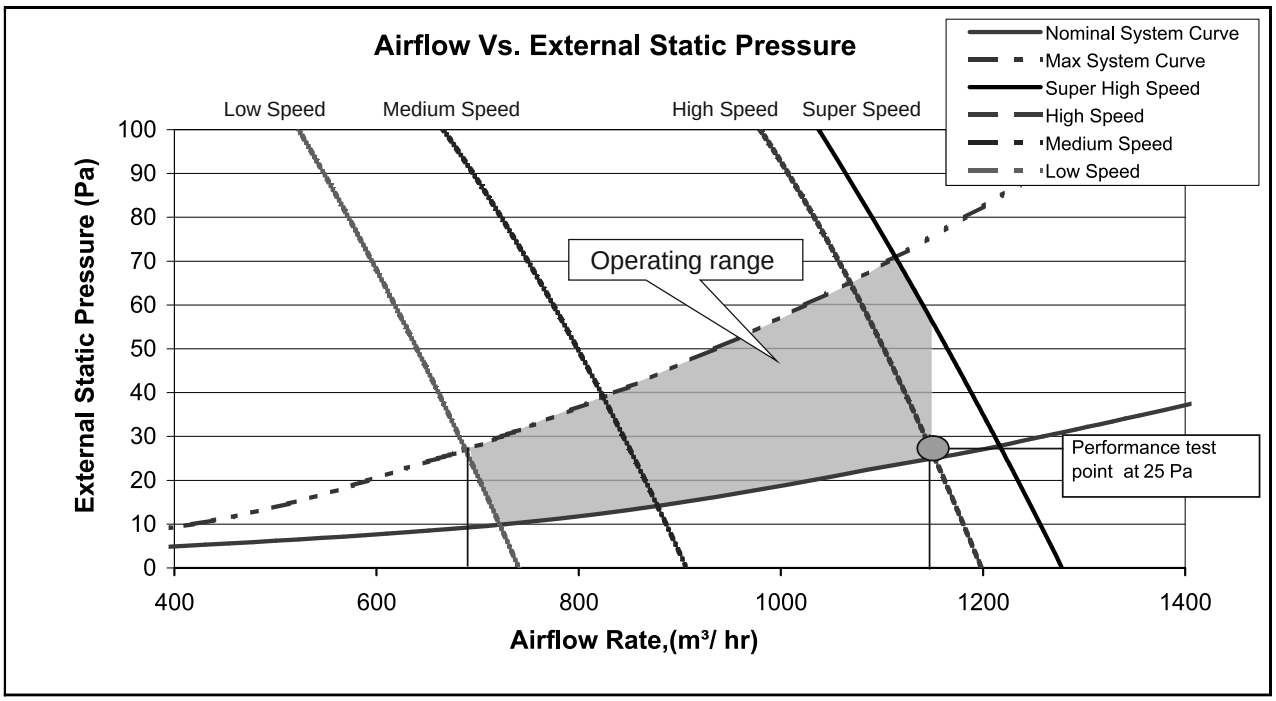
5.20.2 Heating



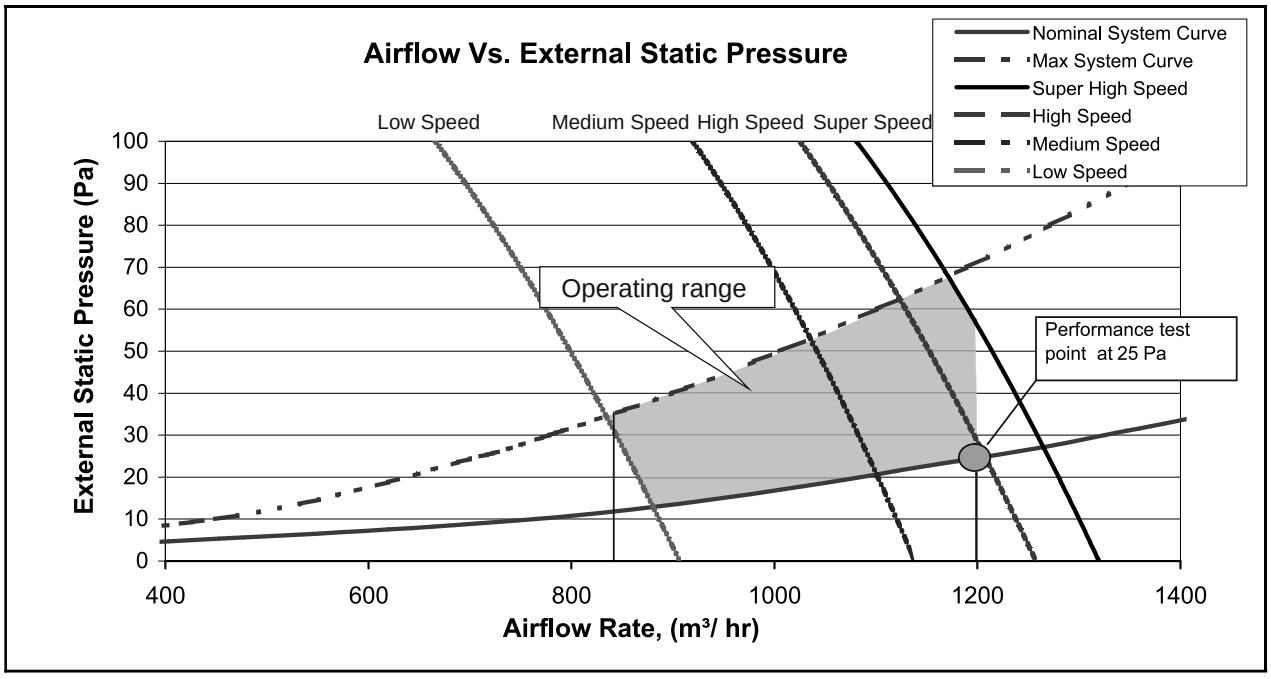


6. AIRFLOW CURVES

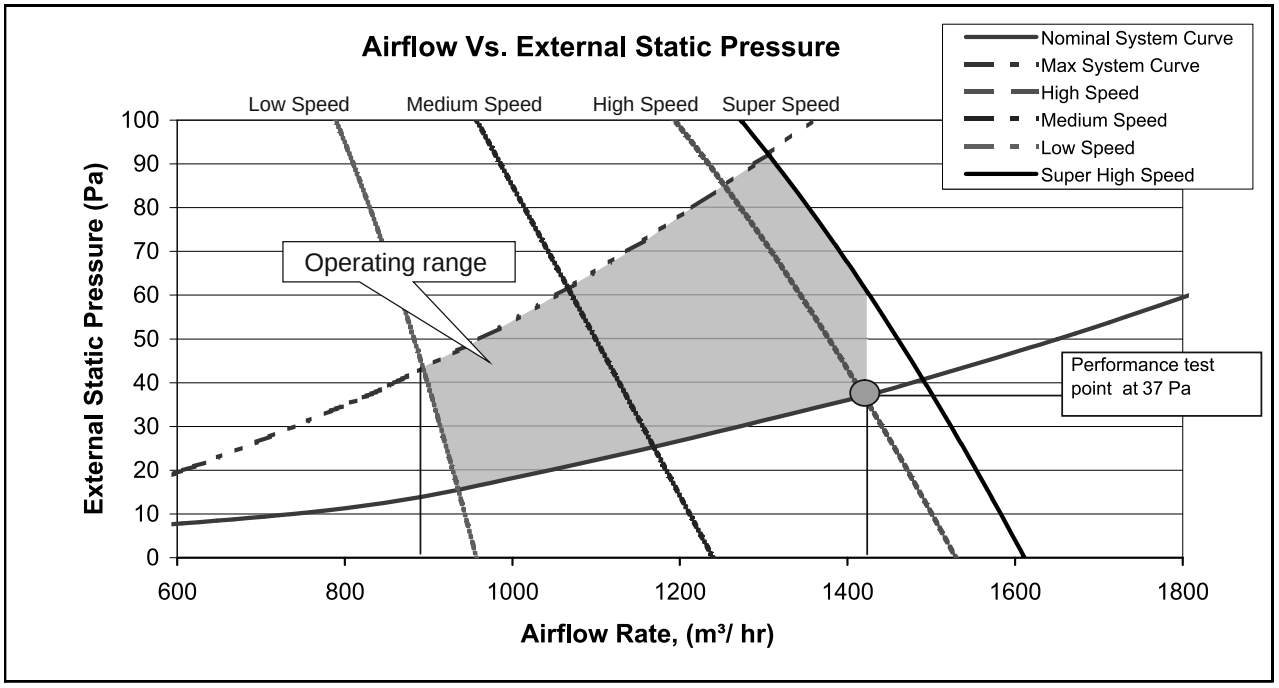
6.1 Model: DLS 18



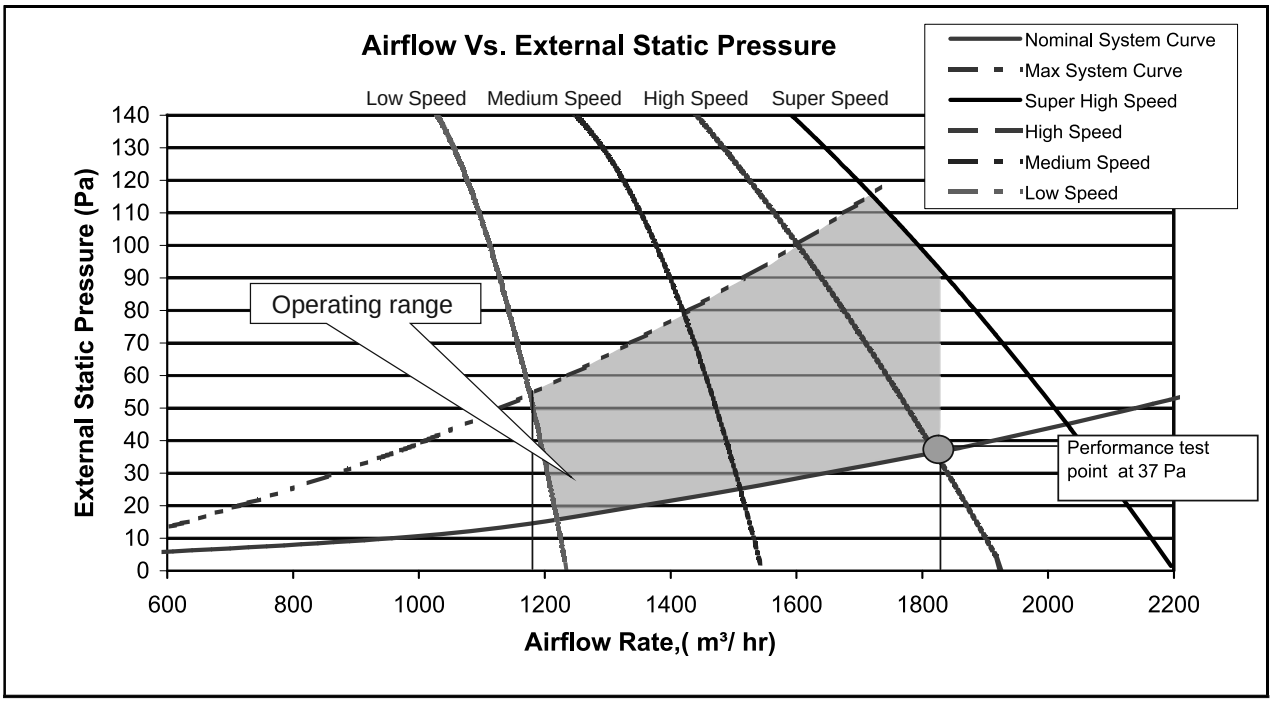
6.2 Model: DLS 24



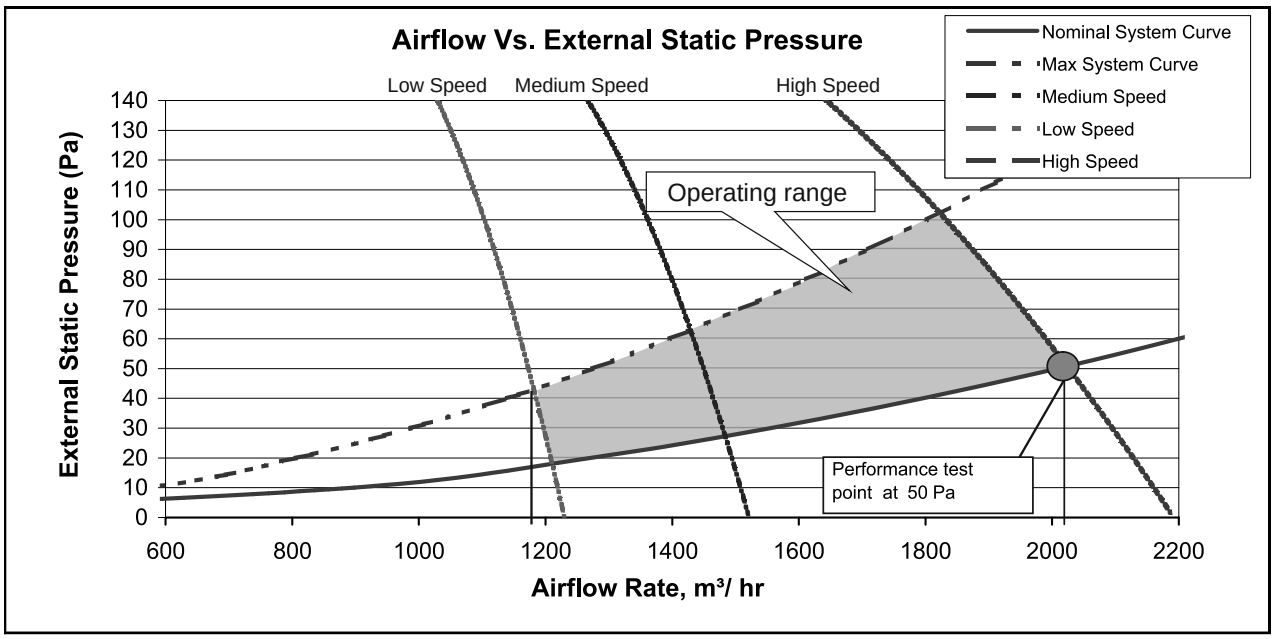
6.3 Model: DLS 30



6.4 Model: DLS 37



6.5 Model: DLS 44



6.6 DLS UNITS RANGE AIR FLOW CORRECTION FACTORS

(at nominal rating conditions).

		Air Flow Rate [% of nominal]				
		60%	70%	80%	90%	100%
Cooling	TC	0.88	0.91	0.94	0.97	1.00
	SC	0.78	0.84	0.89	0.95	1.00
	PI	0.95	0.97	0.98	0.99	1.00
Heating	PI	1.07	1.05	1.03	1.02	1.00
	TC	0.90	0.92	0.95	0.97	1.00

* Permissible Air flow Rate - according to model Air Flow Curves

7. SOUND LEVEL CHARACTERISTICS

7.1 Sound Pressure Level

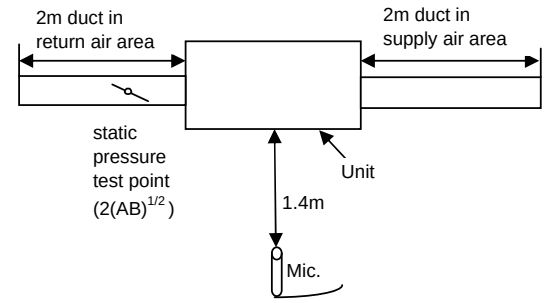
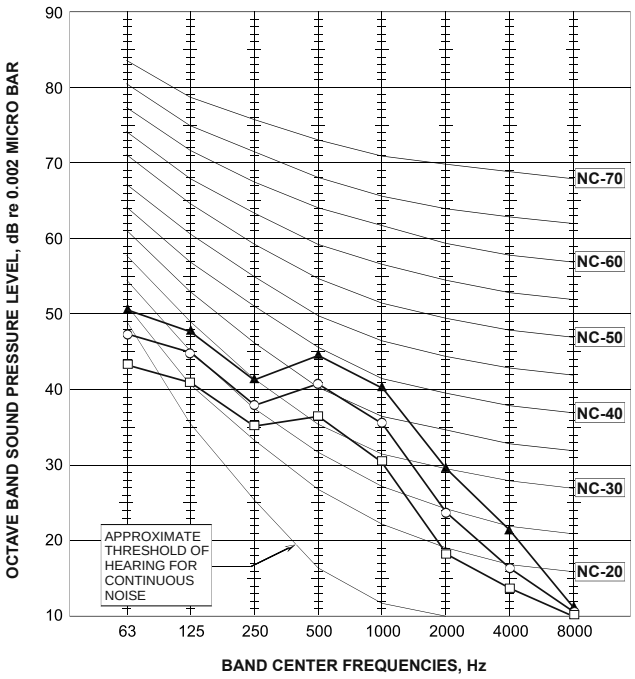


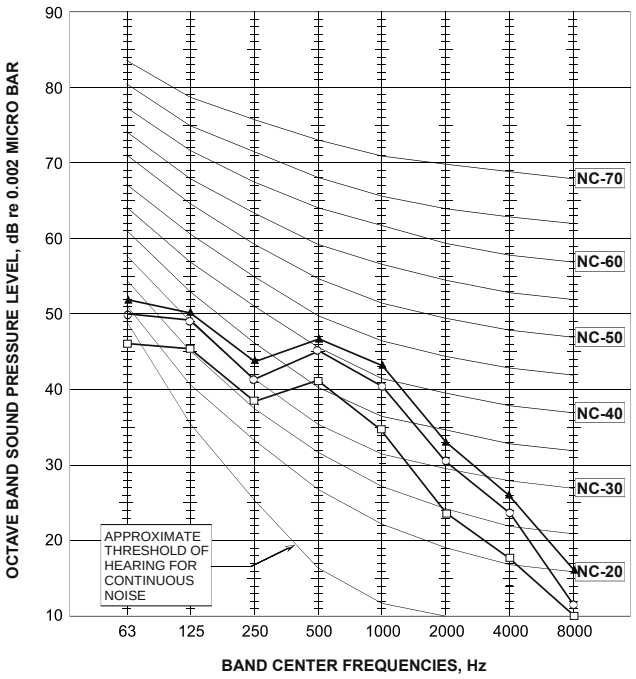
Figure 1

7.2 Soud Pressure Level Spectrum (Measured as Figure 1)

DLS 18

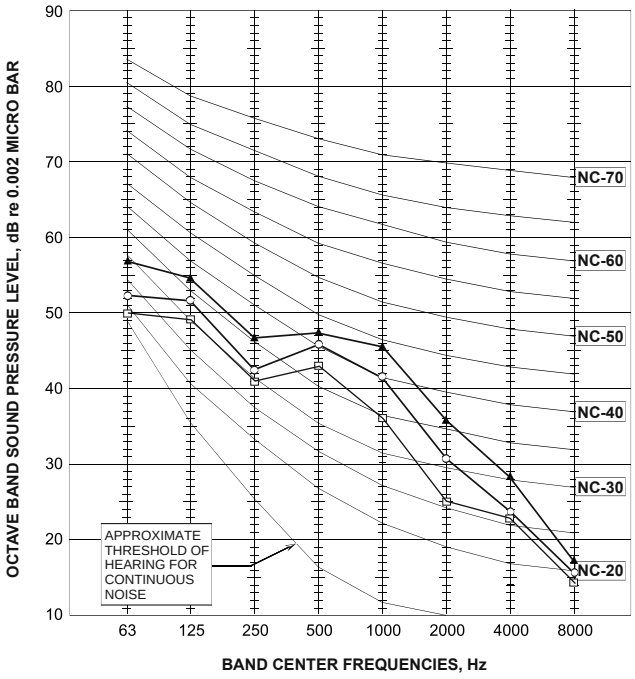


DLS 24

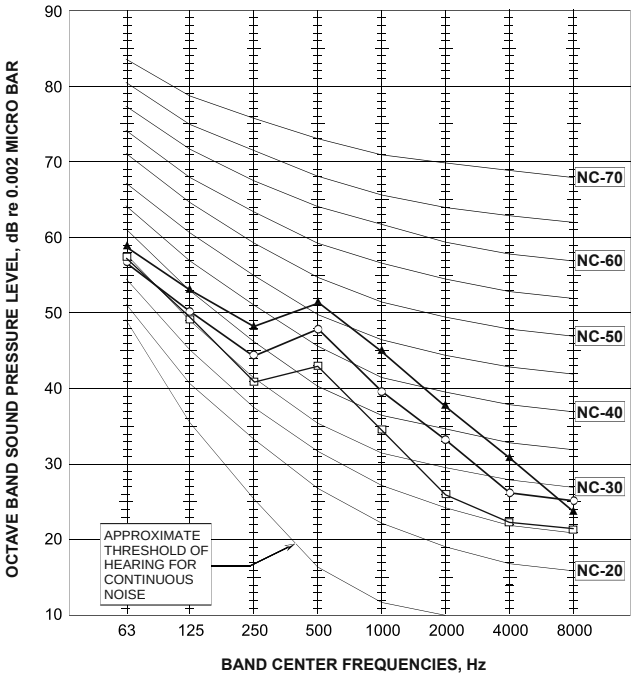


FAN SPEED	LINE
HI	▲
ME	○
LO	□

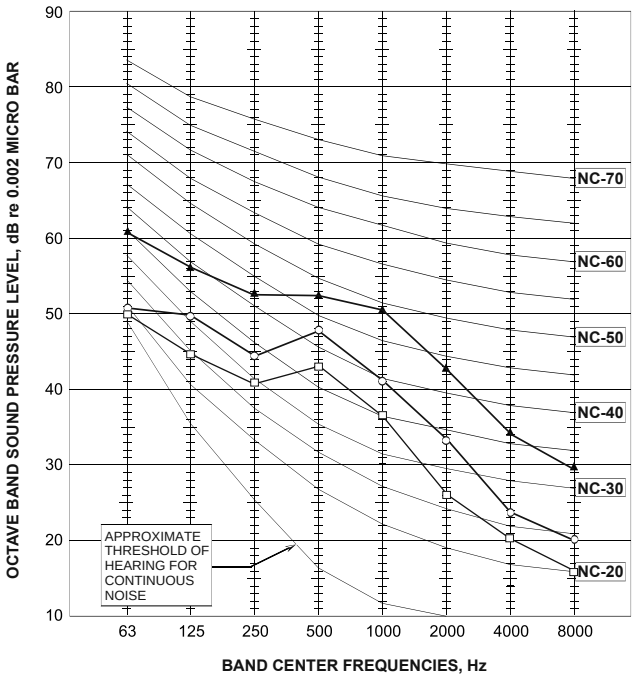
DLS 30



DLS 37



DLS 44



FAN SPEED	LINE
HI	▲
ME	○
LO	□

7.3 Outdoor units

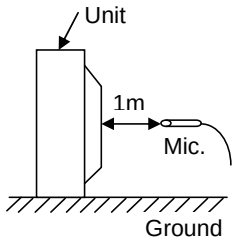
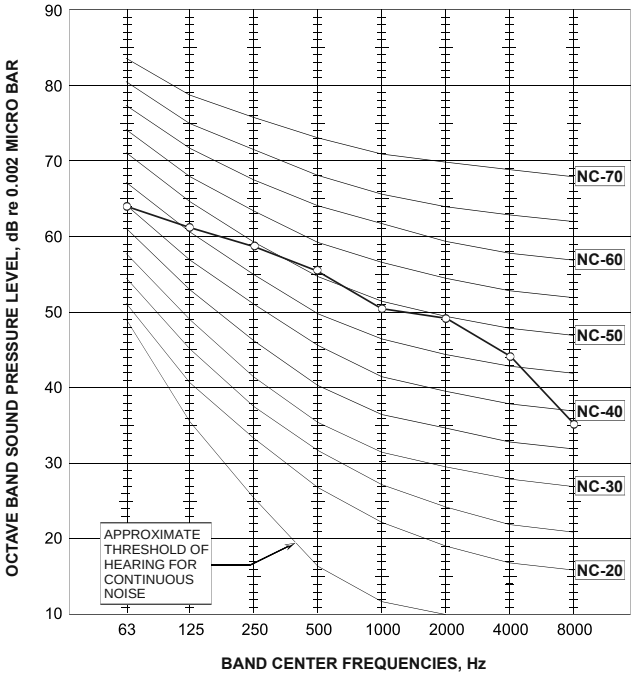


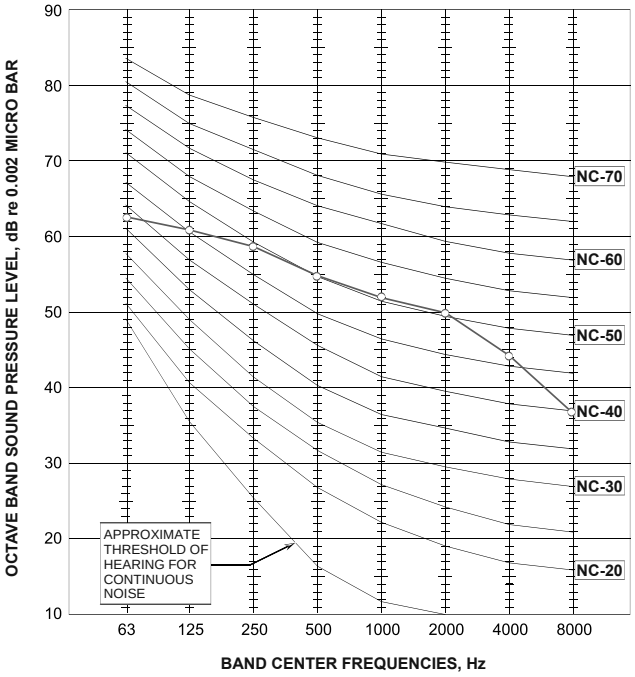
Figure 2

7.4 Sound Pressure Level Spectrum (Measured as Figure 2)

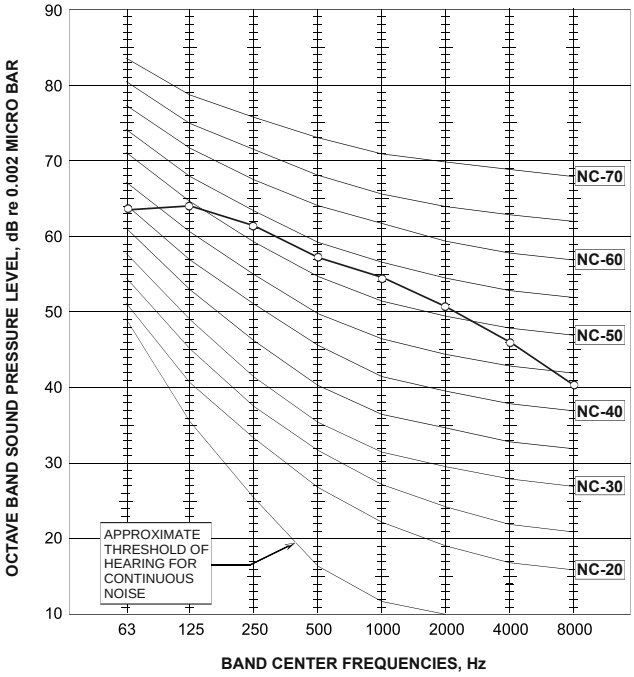
GC 18 Cooling



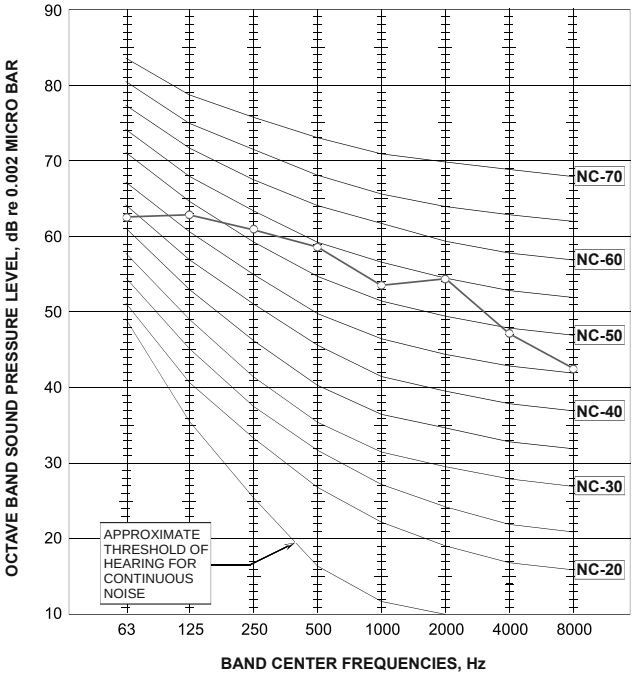
GC 18 Heating



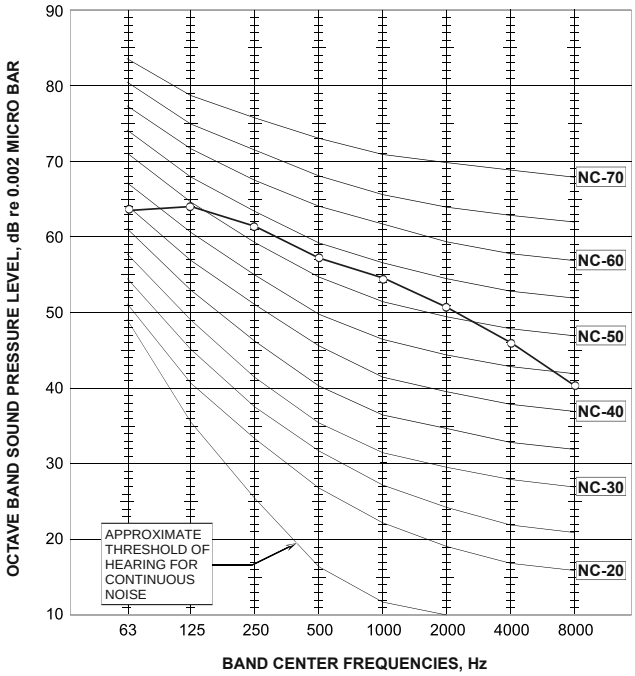
GCN 24 Cooling



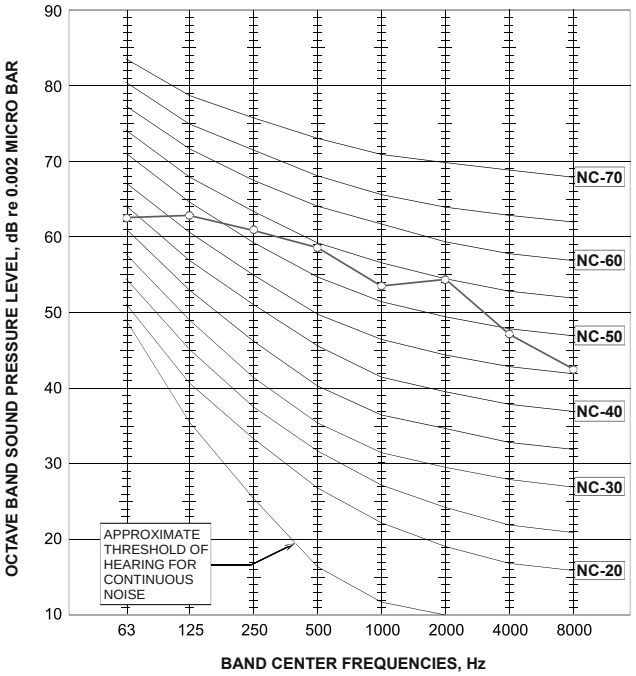
GCN 24 Heating



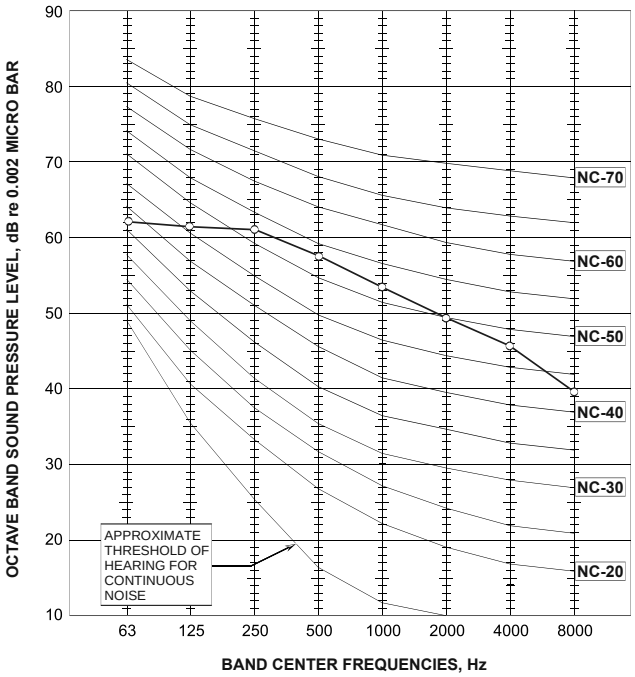
GCN 24Z Cooling



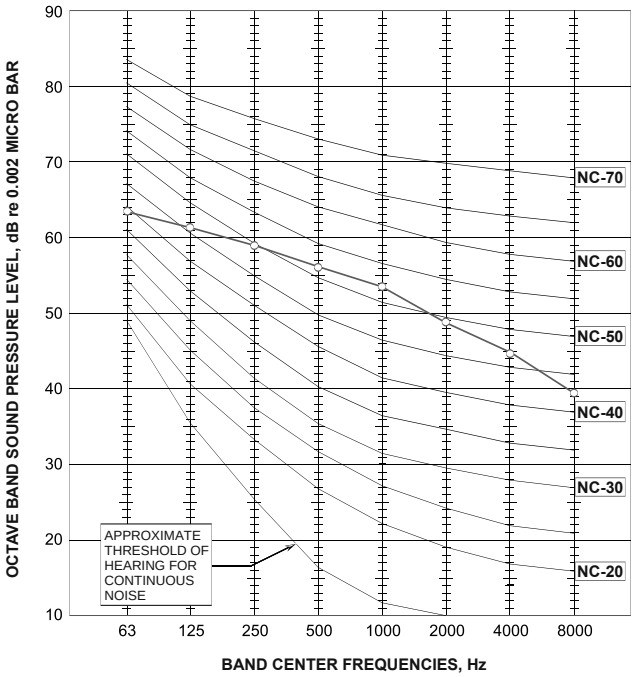
GCN 24Z Heating



OU10-30 Cooling

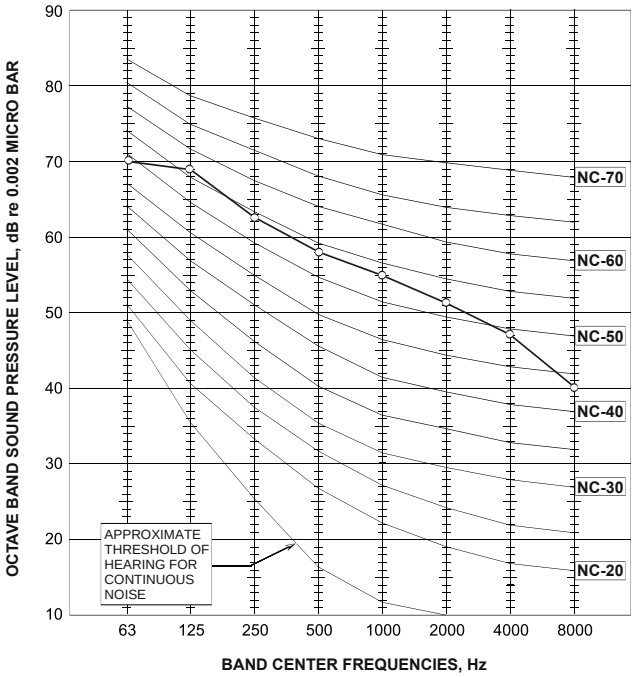


OU10-30 Heating

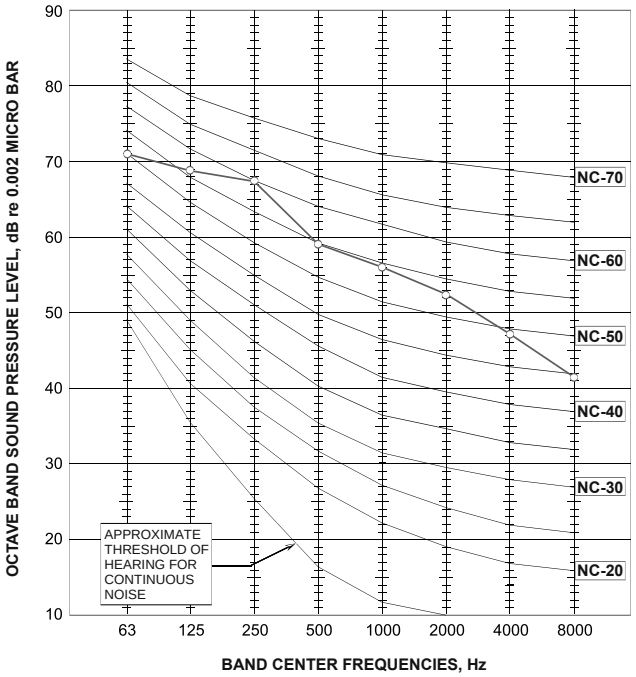


FAN SPEED	LINE
HI	▲
ME	○
LO	□

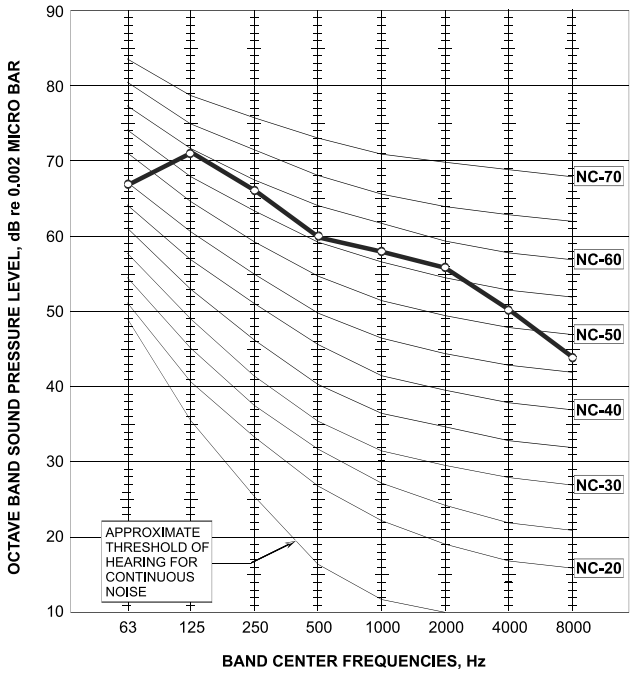
GCN 37 Cooling



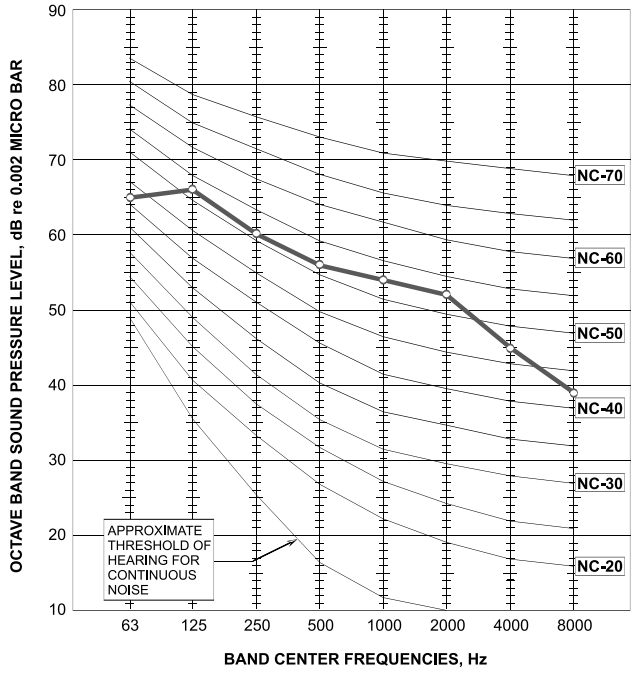
GCN 37 Heating



GCN 42/40T Cooling



GCN 42/40T Heating



FAN SPEED	LINE
HI	▲
ME	○
LO	□

8. ELECTRICAL DATA

18.1 Single Phase Units

MODEL	DLS 18	DLS 18	DLS 24
Power Supply	To Indoor	To Outdoor*	To Outdoor
	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz
Max Current, A			14
Circuit Breaker	20	20	20
Power Supply Wiring No. X Cross Section mm^2	3 X 2.5 mm^2	3 X 2.5 mm^2	3 X 2.5 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	5 X 2.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	5 X 2.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm^2	5 X 2.5 mm^2 + 2 X 0.5 mm^2	5 X 2.5 mm^2 + 2 X 0.5 mm^2	5 X 1.5 mm^2 + 2 X 0.5 mm^2

MODEL	DLS 30	DLS 37	DLS 44
Power Supply	To Outdoor	To Outdoor	To Outdoor
	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz
Max Current, A	17	23	23.5
Circuit Breaker	25	25	40
Power Supply Wiring No. X Cross Section mm^2	3 X 4 mm^2	3 X 4 mm^2	3 X 6 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm^2	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)

18.2 Three Phase Units

MODEL	DLS 18	DLS 24	DLS 30
Power Supply	To Outdoor	To Outdoor	To Outdoor
	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz
Max Current, A	4.6	8.0	10
Circuit Breaker	3 X 10	3 X 10	3 X 16
Power Supply Wiring No. X Cross Section mm^2	5 X 1.5 mm^2	5 X 1.5 mm^2	5 X 2.5 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm^2	5 X 1.5 mm^2 + 2 X 0.5 mm^2	5 X 1.5 mm^2 + 2 X 0.5 mm^2	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)

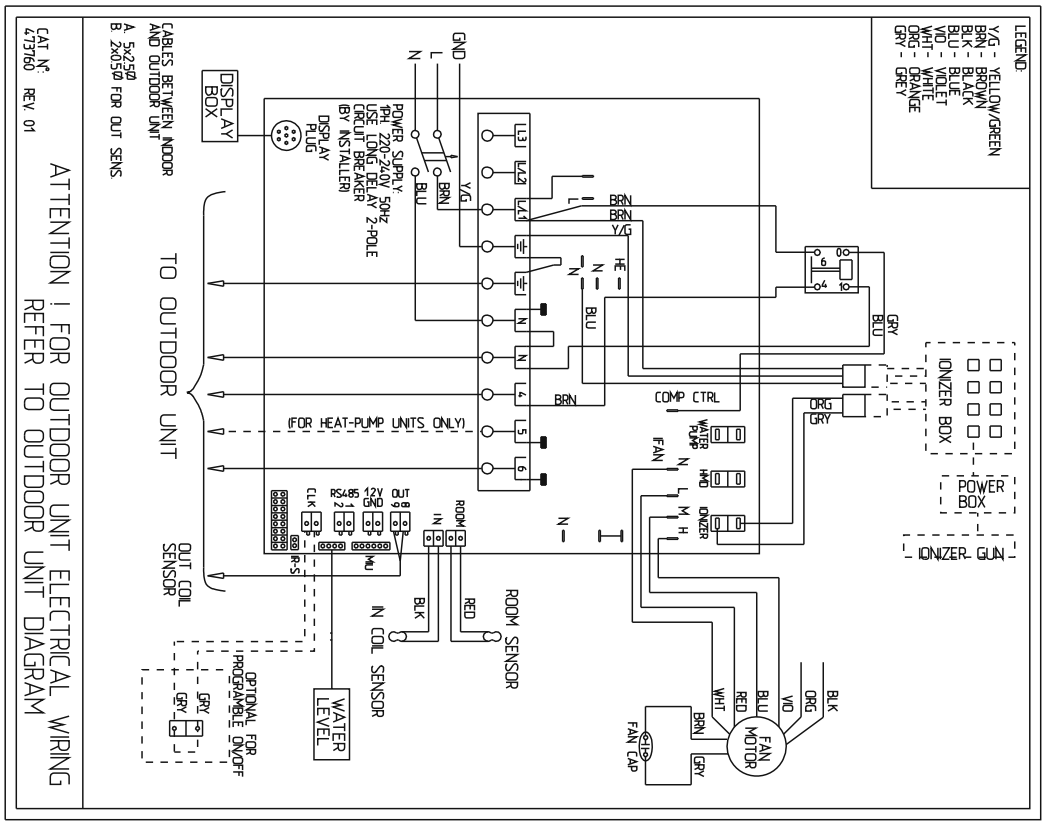
MODEL	DLS 37	DLS 44
Power Supply	To Outdoor	To Outdoor
	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz
Max Current, A	12.5	17
Circuit Breaker	3 X 16	3 X 16
Power Supply Wiring No. X Cross Section mm^2	5 X 2.5 mm^2	5 X 2.5 mm^2
Interconnecting Cable RC Model No. X Cross Section mm^2	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	6 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm^2	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)	5 X 1.5 mm^2 + 2 X 0.5 mm^2 (OCT Sensor)

NOTE: Power wiring cord should comply with local lows and electrical regulations requirements.

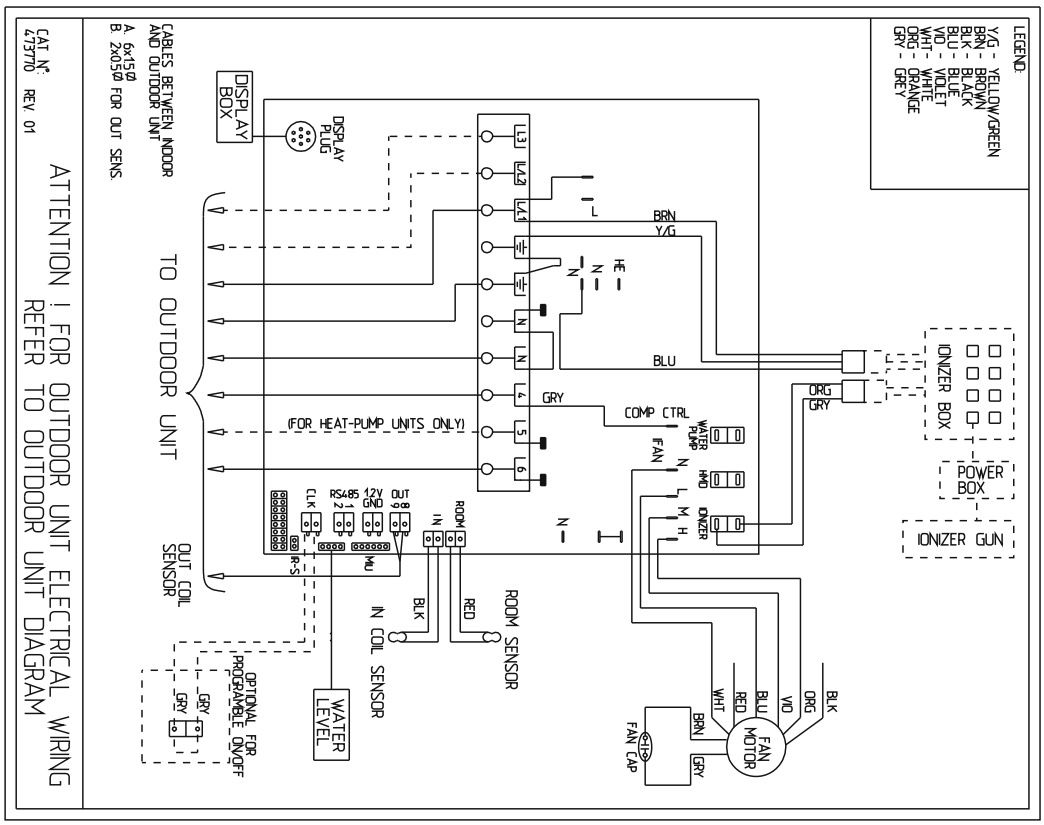
*Optional

9. WIRING DIAGRAMS

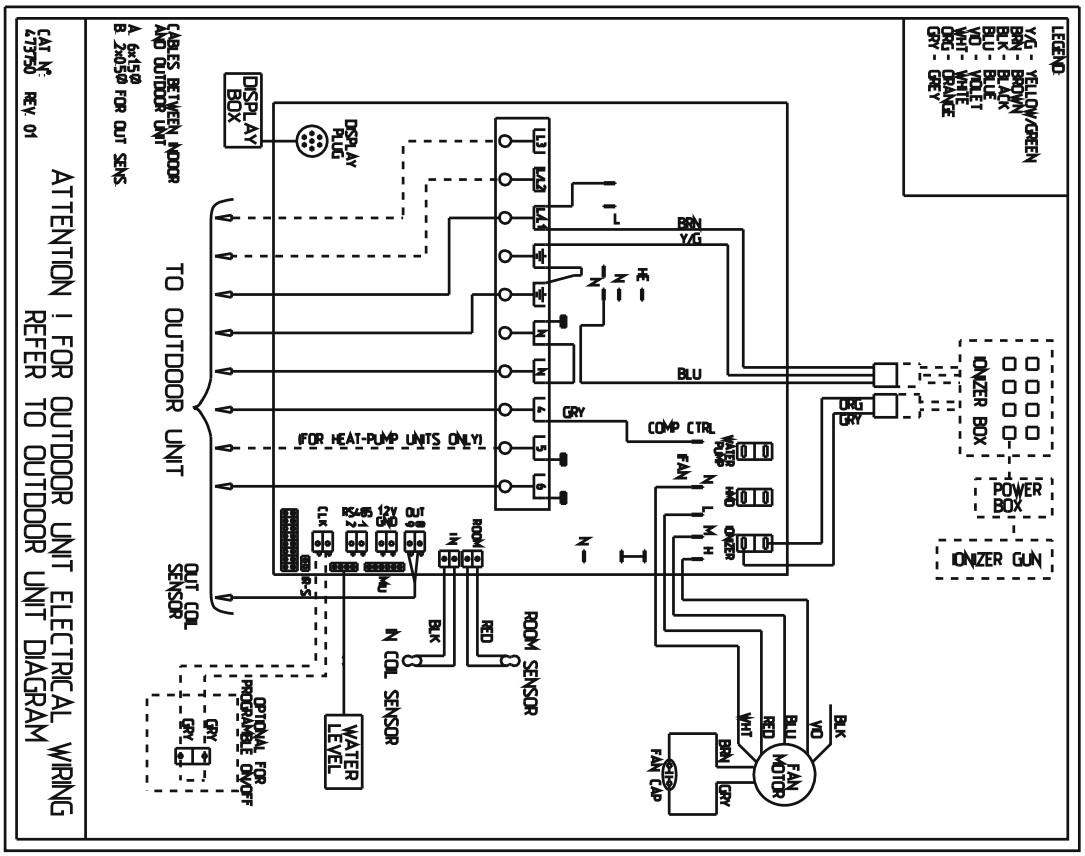
9.1 Indoor Unit: DLS 18



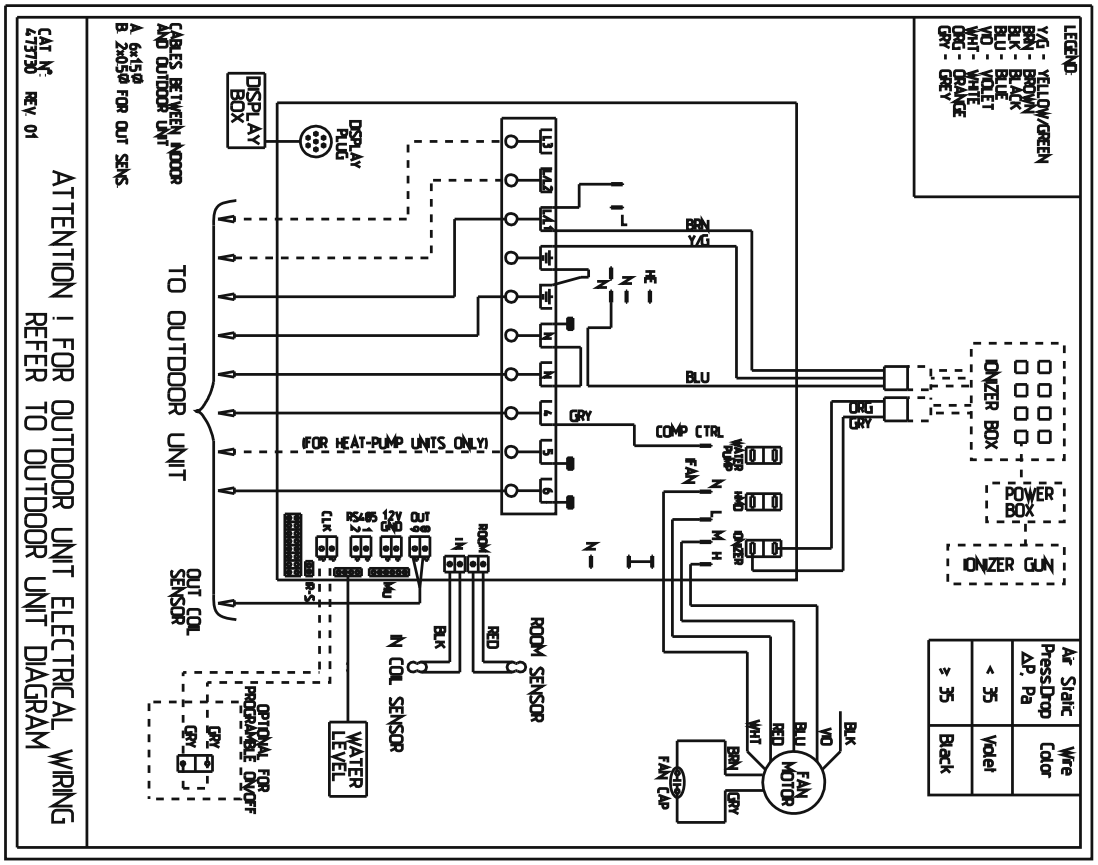
9.2 Indoor Unit: DLS 24



9.3 Indoor Unit: DLS 30, DLS 37

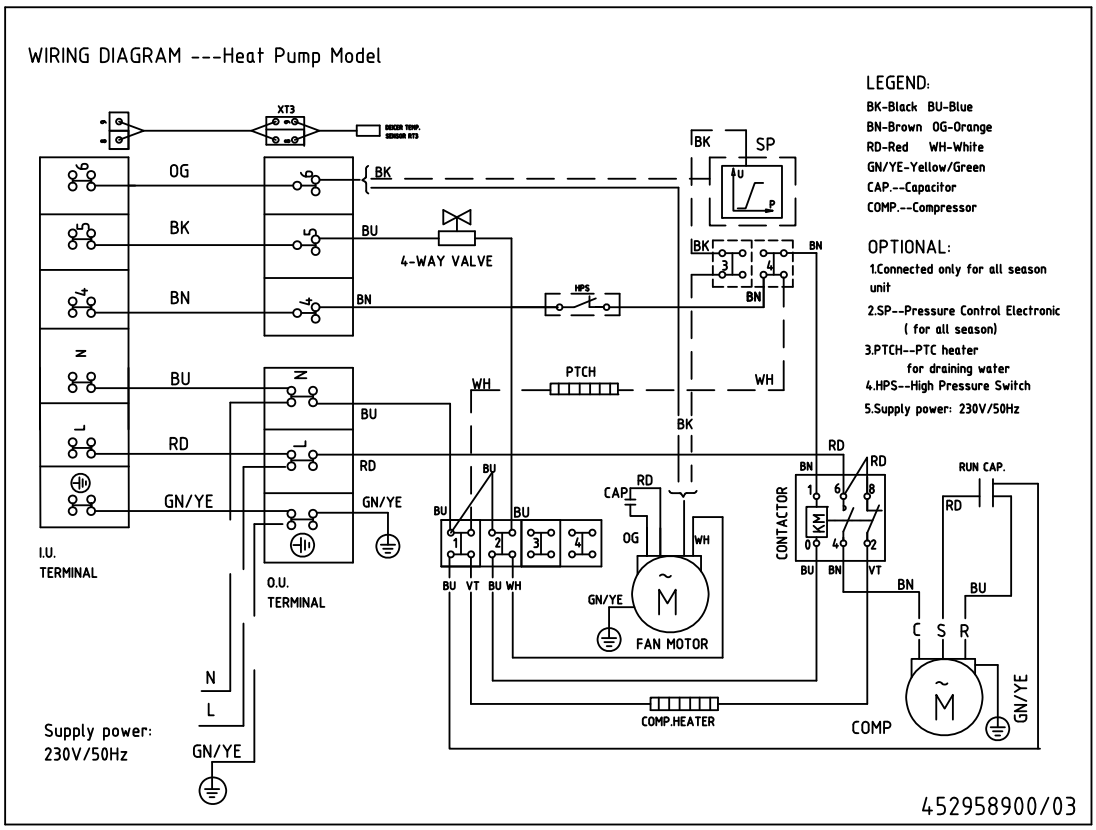


9.4 Indoor Unit: DLS 44

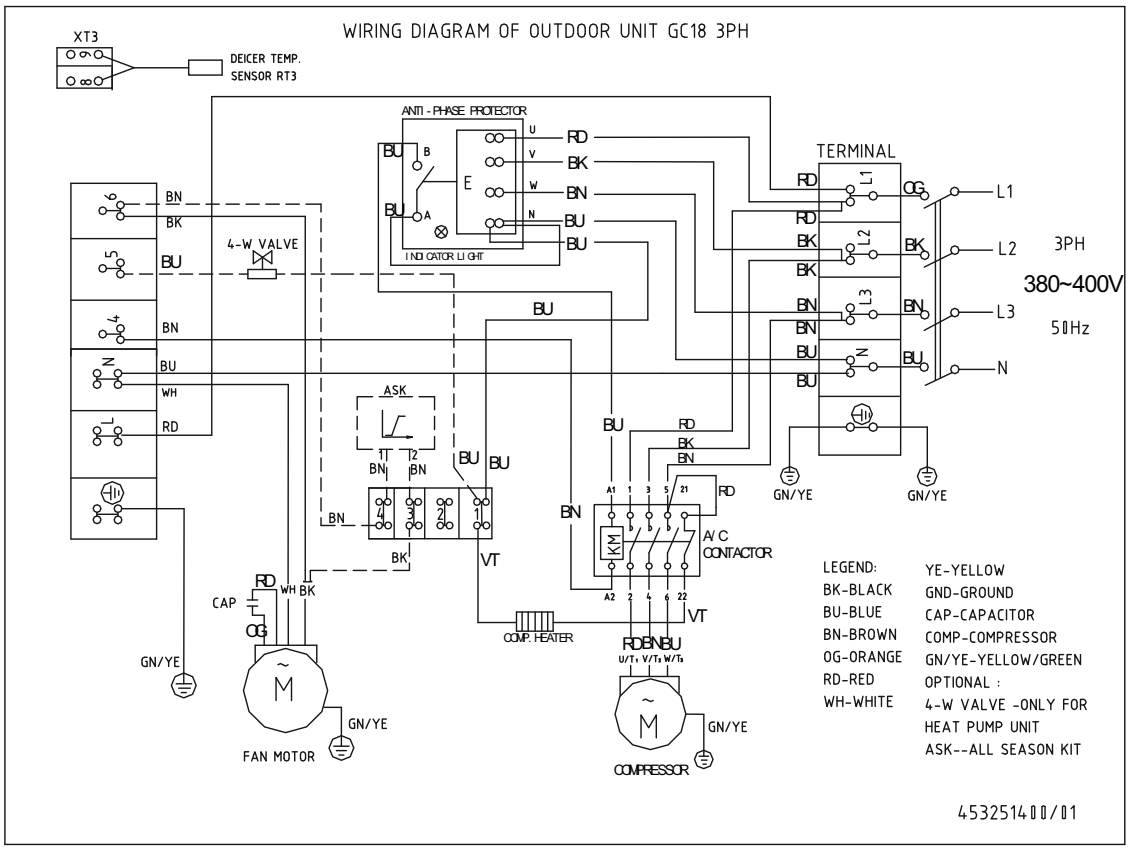


CONTENTS

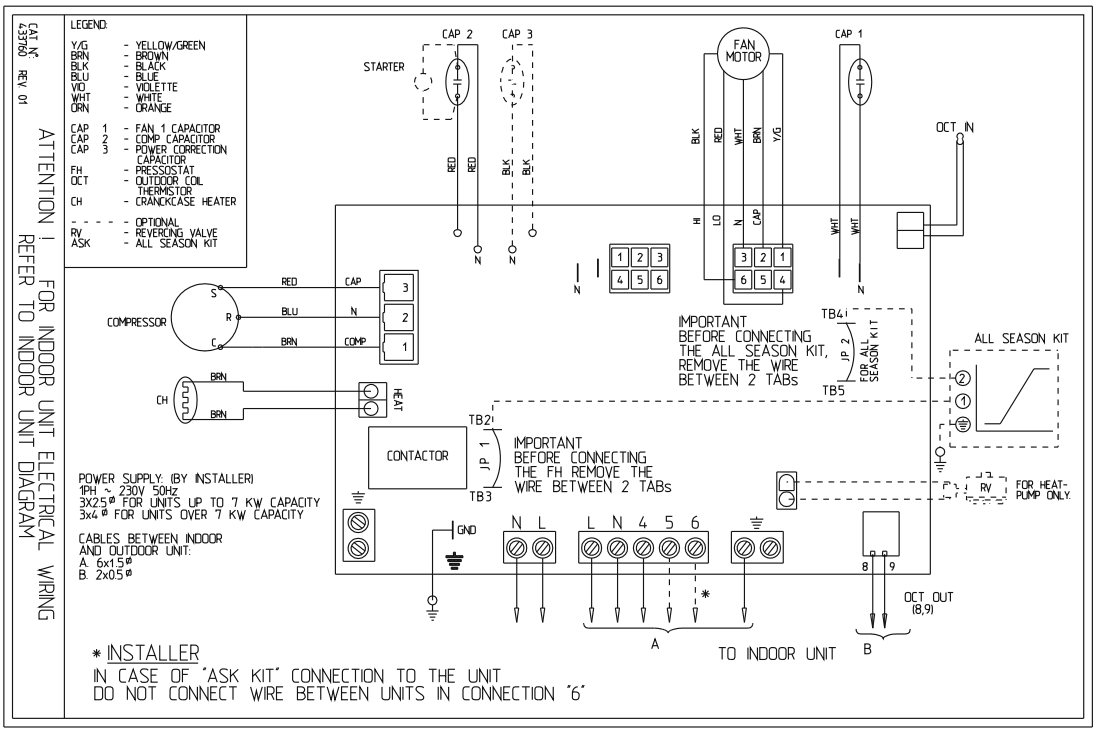
9.5 Outdoor Unit: GC 18 1PH



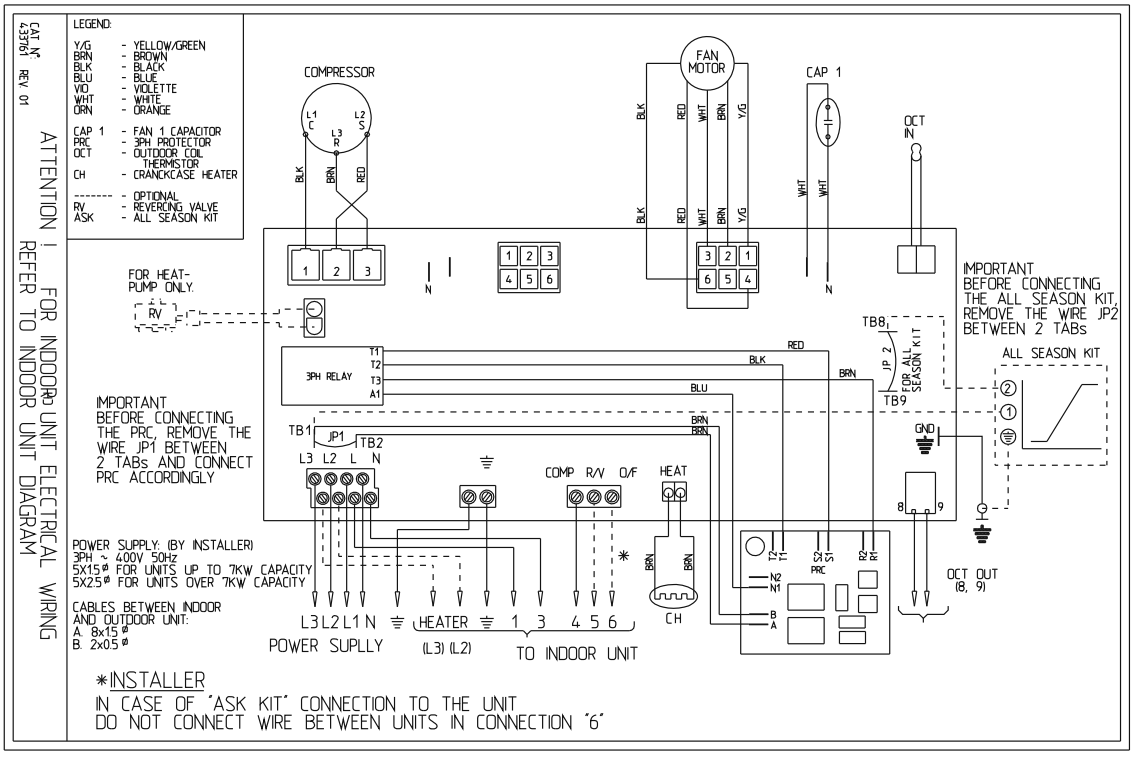
9.6 Outdoor Unit: GC 18 3PH



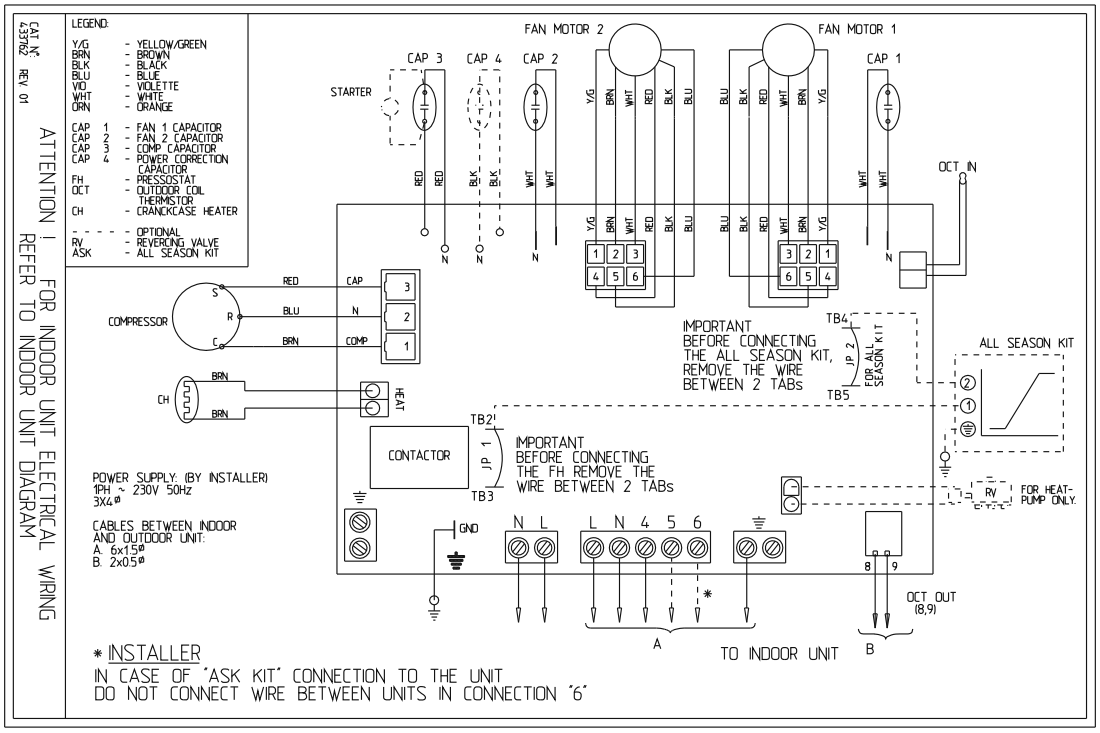
9.7 Outdoor Unit: GCN 24 / GCN 24Z / GCN 30 1PH



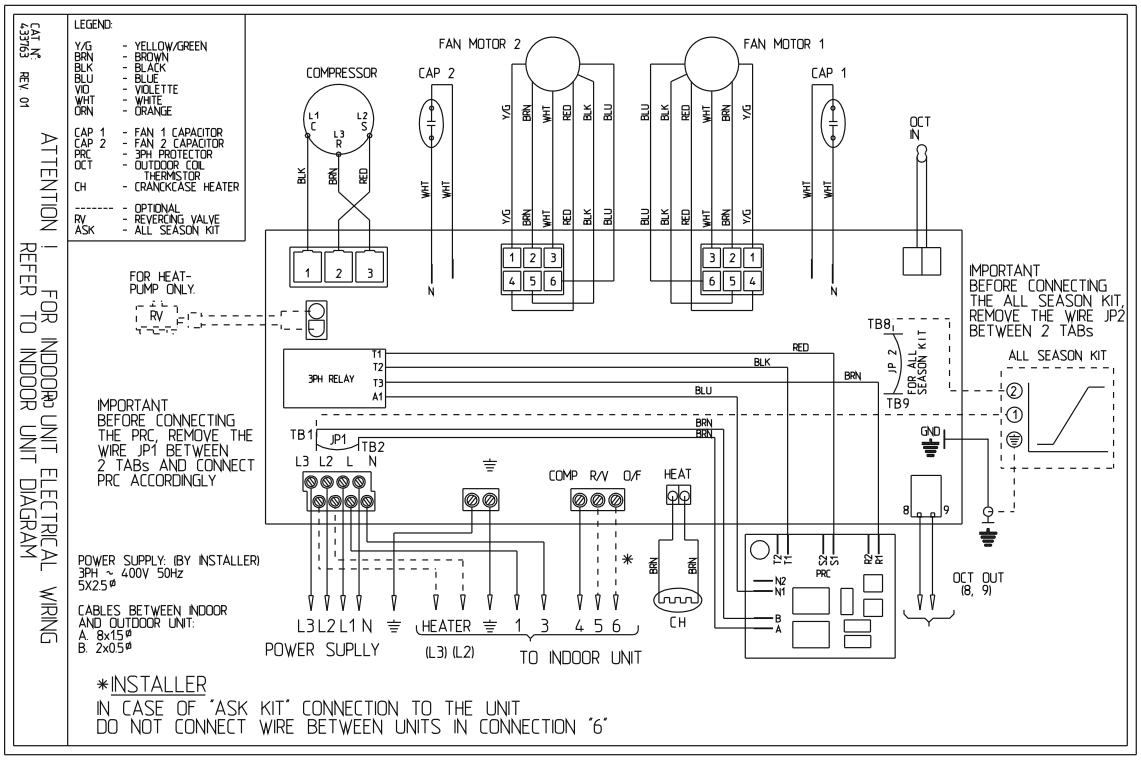
9.8 Outdoor Unit: GCN 24 / GCN 30 3PH


CAT N° 43761 REV 01
ATTENTION ! FOR INDOOR UNIT ELECTRICAL WIRING
REFER TO INDOOR UNIT DIAGRAM
LEGEND:
Y/G - YELLOW/GREEN
BRN - BROWN
BLK - BLACK
BLU - BLUE
VIO - VIOLETTE
WHT - WHITE
ORN - ORANGE
CAP 1 - FAN 1 CAPACITOR
PRC - 3PH PROTECTOR
OCT - OUTDOOR COIL THERMISTOR
CH - CRANCKCASE HEATER
OPTIONAL
RV - REVERCING VALVE
ASK - ALL SEASON KIT
COMPRESSOR
FAN MOTOR
CAP 1
OCT IN
FOR HEAT-PUMP ONLY.
RV
3PH RELAY
IMPORTANT BEFORE CONNECTING THE PRC, REMOVE THE WIRE JP1 BETWEEN 2 TABs AND CONNECT PRC ACCORDINGLY
IMPORTANT BEFORE CONNECTING THE ALL SEASON KIT, REMOVE THE WIRE JP2 BETWEEN 2 TABs
ALL SEASON KIT
COMP R/V O/F
HEAT
CH
POWER SUPPLY: (BY INSTALLER)
3PH ~ 400V 50Hz
5X1.5ø FOR UNITS UP TO 7KW CAPACITY
5X2.5ø FOR UNITS OVER 7KW CAPACITY
CABLES BETWEEN INDOOR AND OUTDOOR UNIT:
A. 8x1.5ø
B. 2x0.5ø
L3 L2 L1 N
POWER SUPLLY
HEATER
(L3) (L2)
1 3 4 5 6
TO INDOOR UNIT
OCT OUT (8, 9)
* INSTALLER
IN CASE OF "ASK KIT" CONNECTION TO THE UNIT
DO NOT CONNECT WIRE BETWEEN UNITS IN CONNECTION "6"

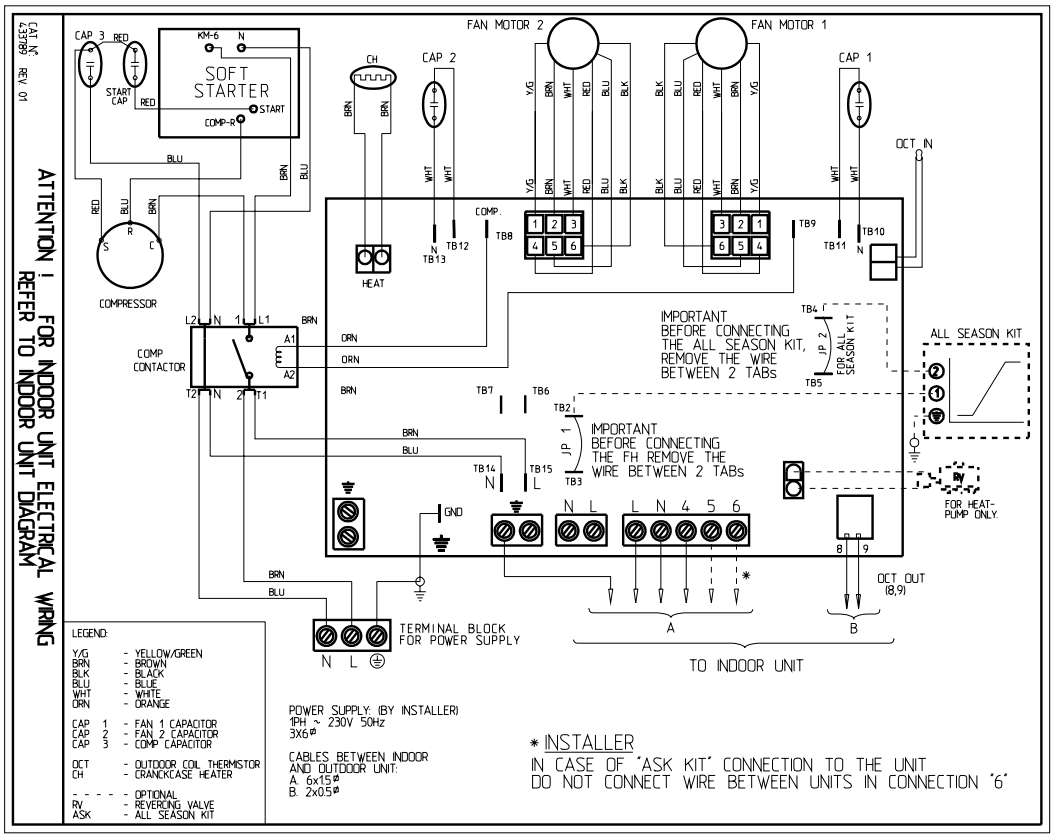
9.9 Outdoor Unit: GCN 37 1PH



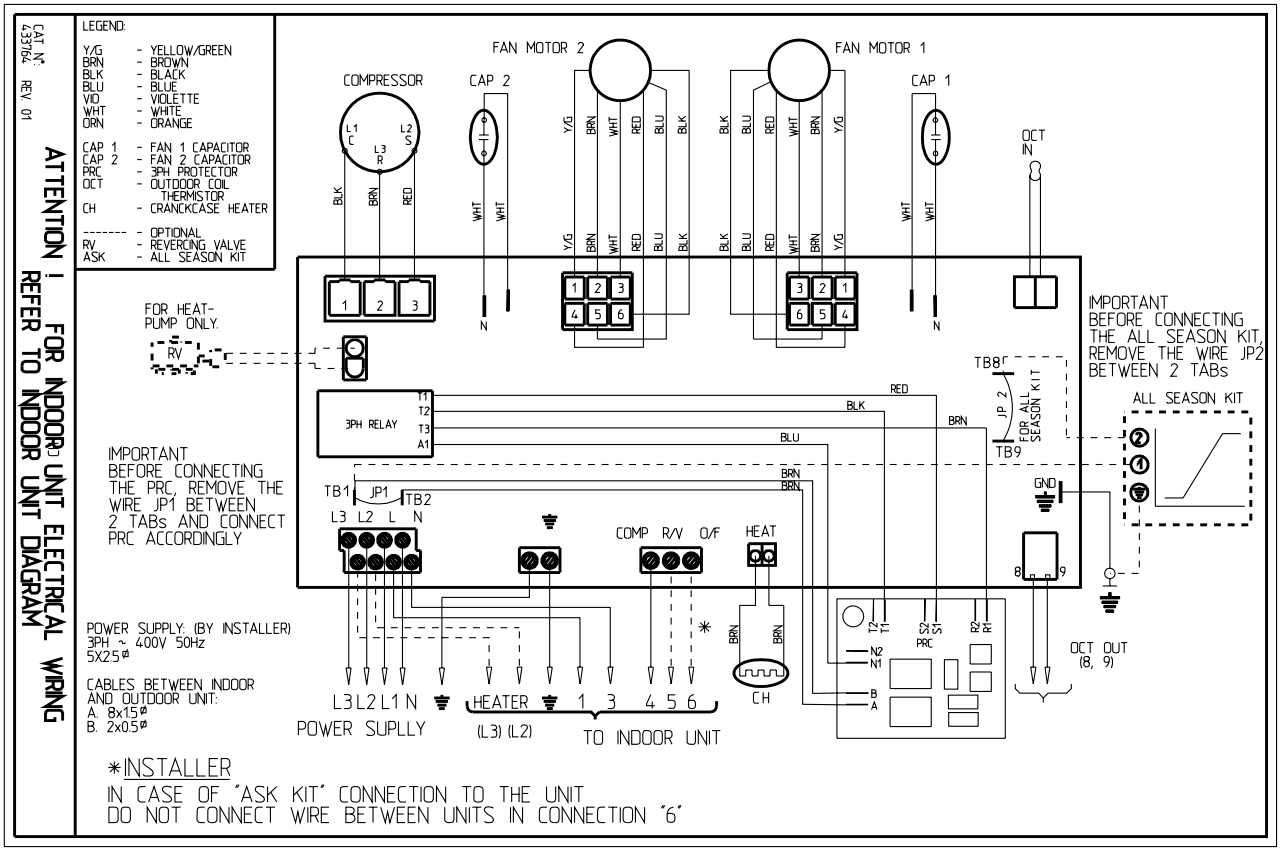
9.10 Outdoor Unit: GCN 37 3PH



9.11 Outdoor Unit: GCN 42 1PH



9.12 Outdoor Unit: GCN 40 3PH



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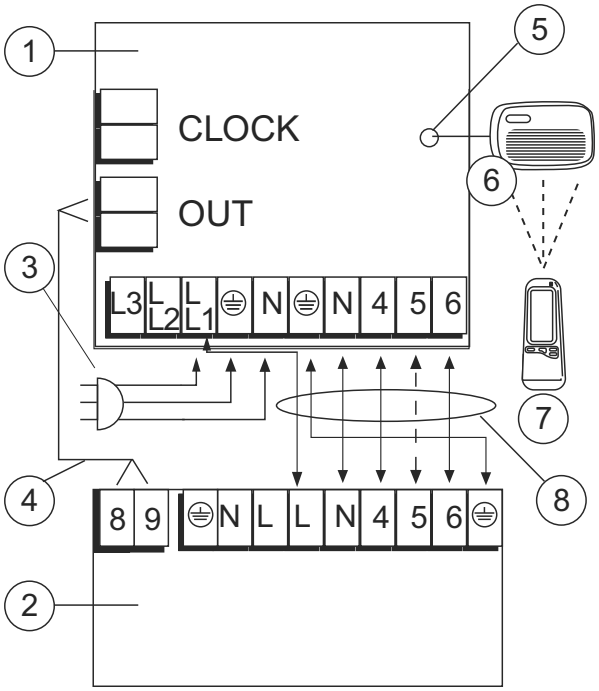
10. ELECTRICAL CONNECTIONS

10.1 DLS 18 1PH (Power supply to Indoor)

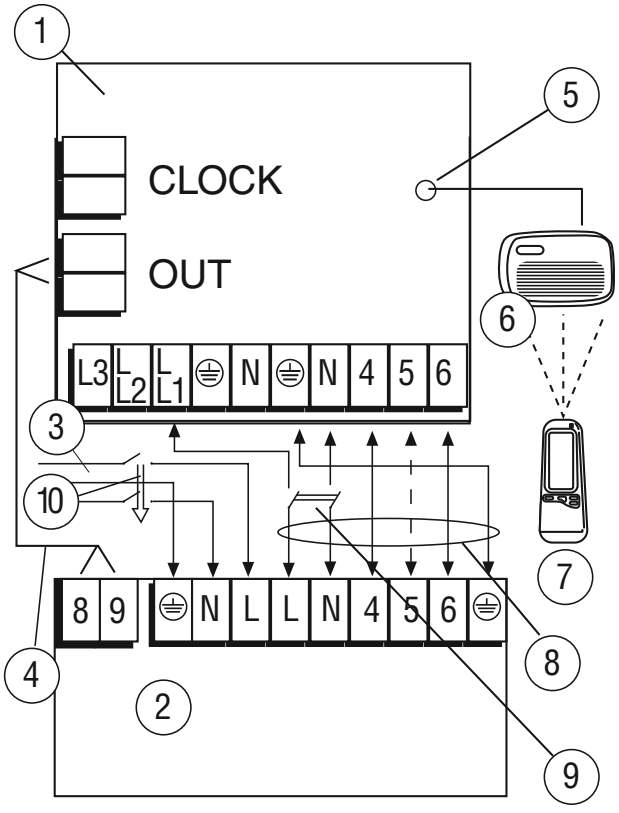
1. Indoor Unit
2. Outdoor Unit
3. Power supply
4. Control cable (2 x 0.5mm²)
5. Display connector
6. Display unit
7. Wireless remote control
8. Inter connecting cable (6 x 2.5mm²)



– – – – – *For Heat-pump units only*

10.2 DLS 18, 24, 30, 37, 44 1PH (Power supply to Outdoor)

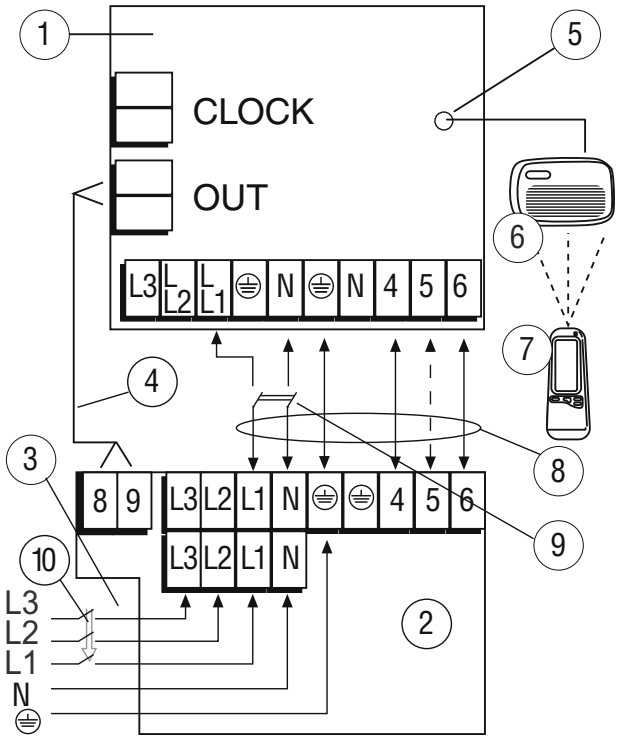
1. Indoor unit
2. Outdoor unit
3. Power supply cable
4. Control cable (2 x 0.5mm²)
5. Display connector
6. Display unit
7. Wireless remote control
8. Inter connecting cable (6 x 1.5mm²)/ for DLS18 (6 x 2.5mm²)
9. Switch ON-OFF
10. Circuit breaker



– – – – – *For Heat-pump units only*

10.3 DLS 24, 30, 37, 44 3PH

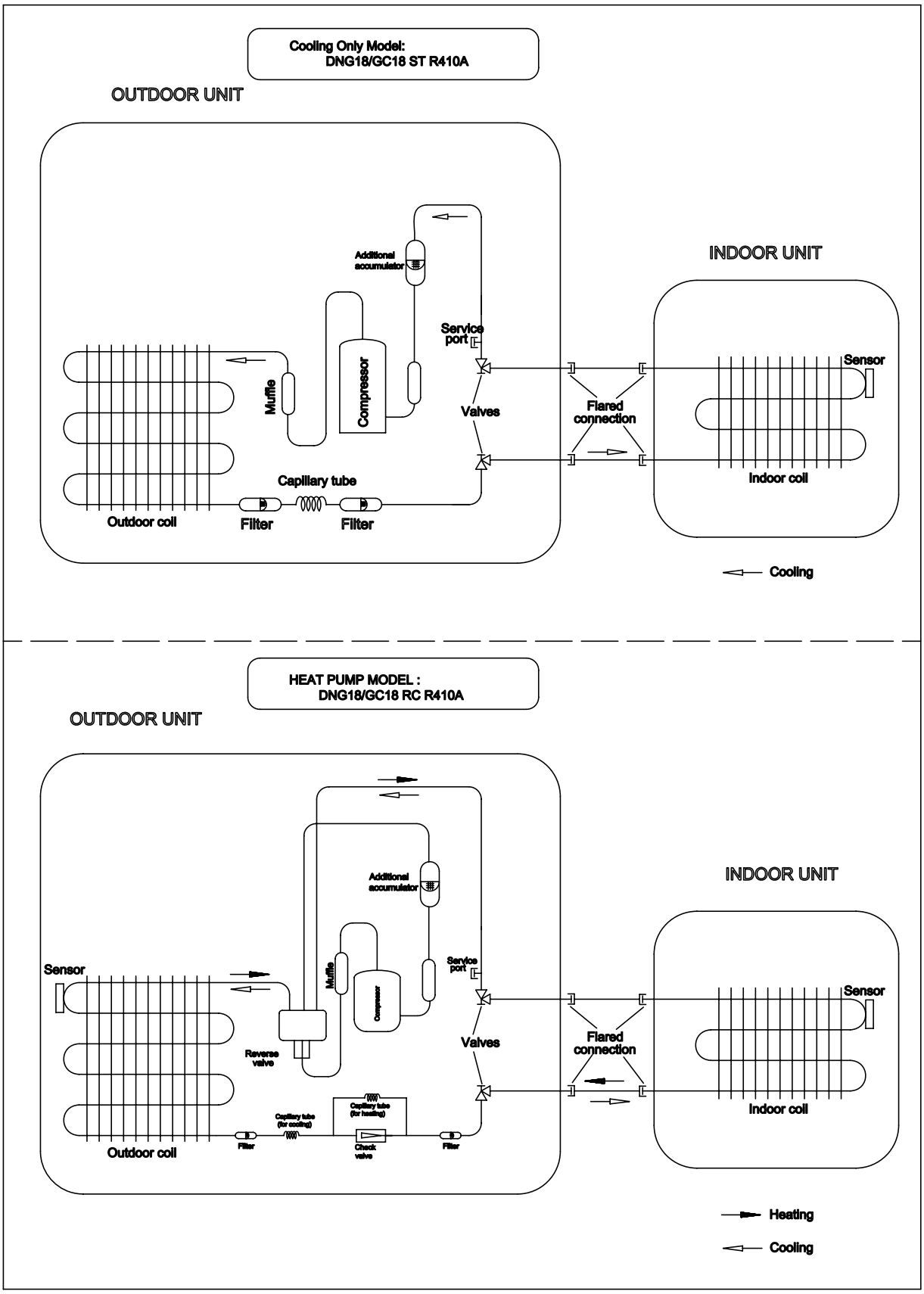
1. **Indoor unit**
2. **Outdoor unit**
3. **Power supply cable**
4. **Control cable (2 x 0.5mm²)**
5. **Display connector**
6. **Display unit**
7. **Wireless remote control**
8. **Inter connecting cable (6 x 1.5mm²)**
9. **Switch ON-OFF**
10. **Circuit breaker**



11. REFRIGERATION DIAGRAMS

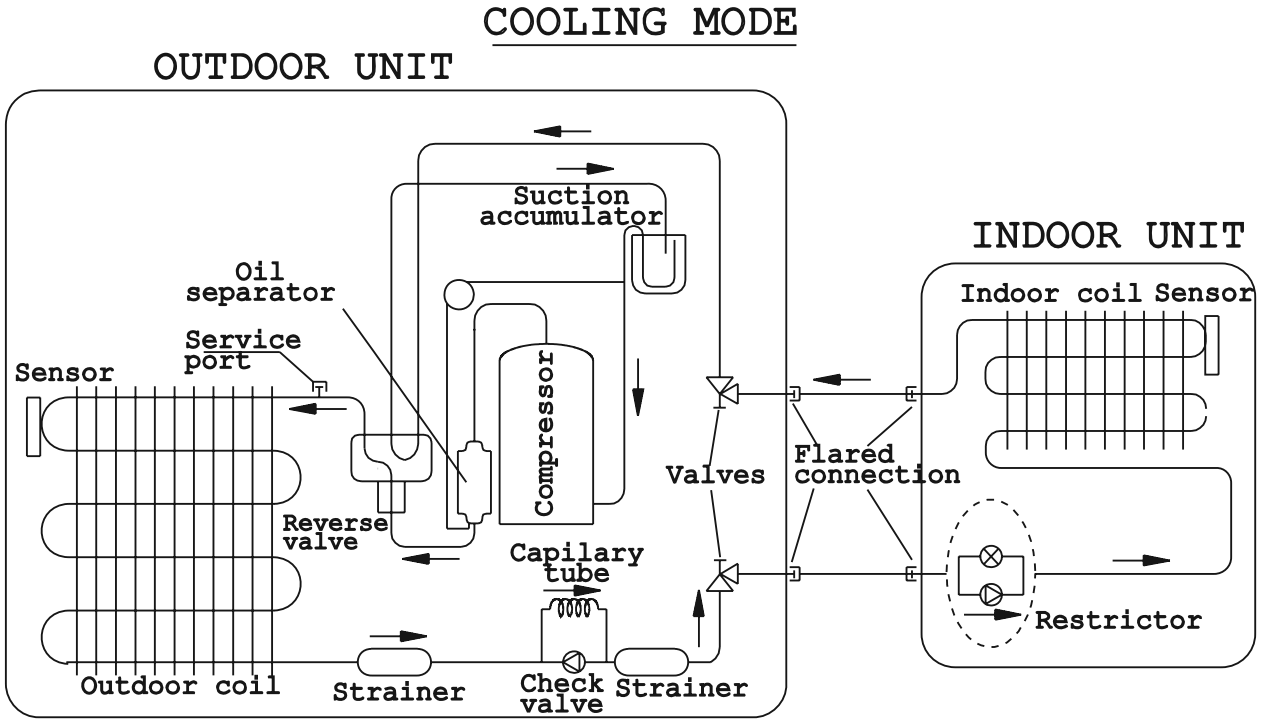
11.1 Heat Pump Models

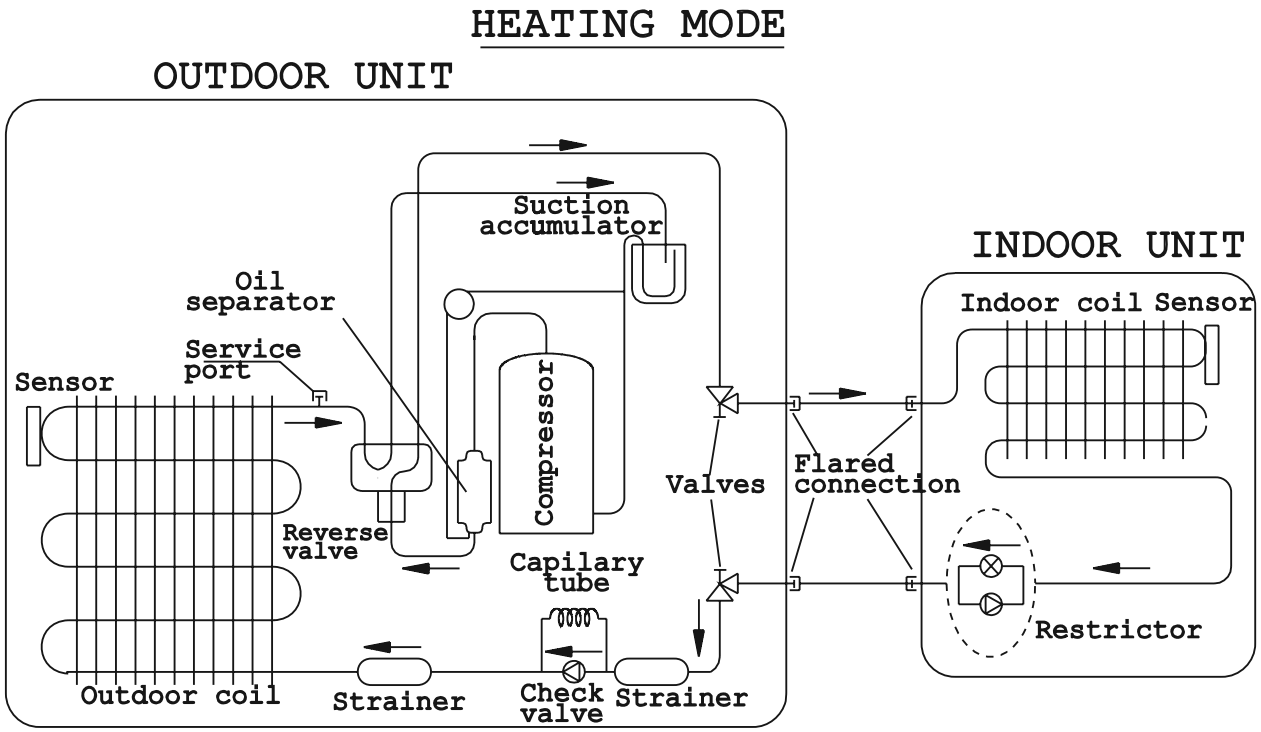
11.1.1 DLS 18 / GC 18 RC/ST



11.2 Heat Pump Models

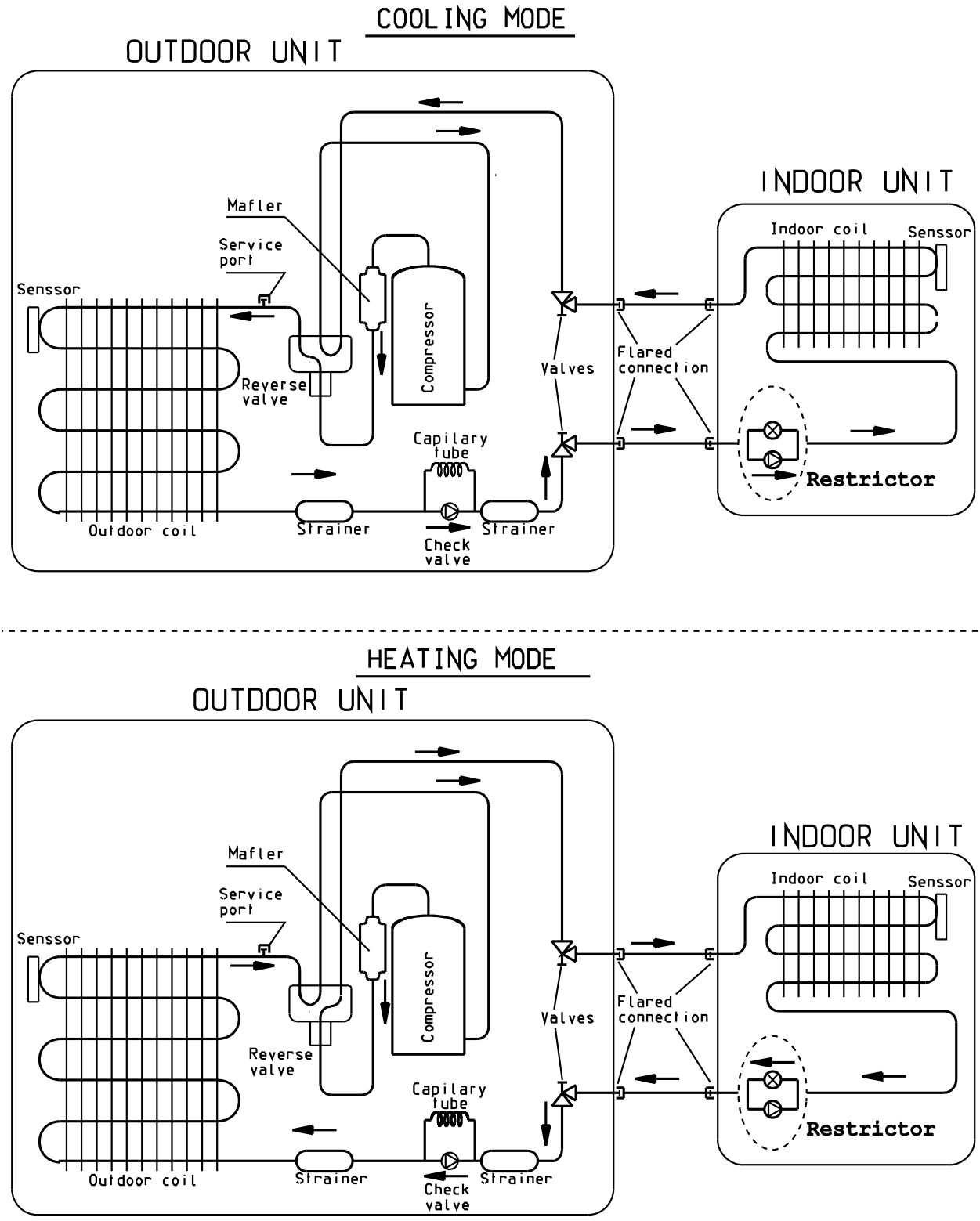
11.2.1 DLS 24 / GCN 24 RC, DLS 44 / GCN 42 RC, DLS 44 / GCN 40T RC





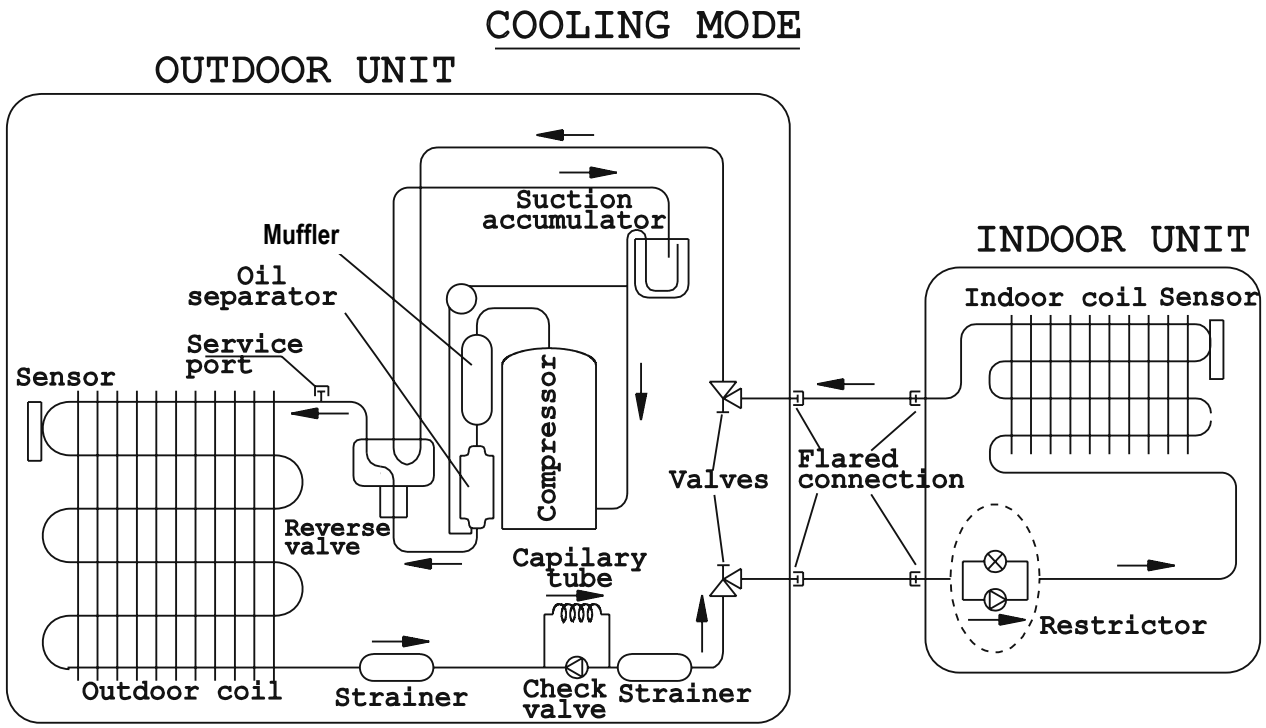
11.2 Heat Pump Models

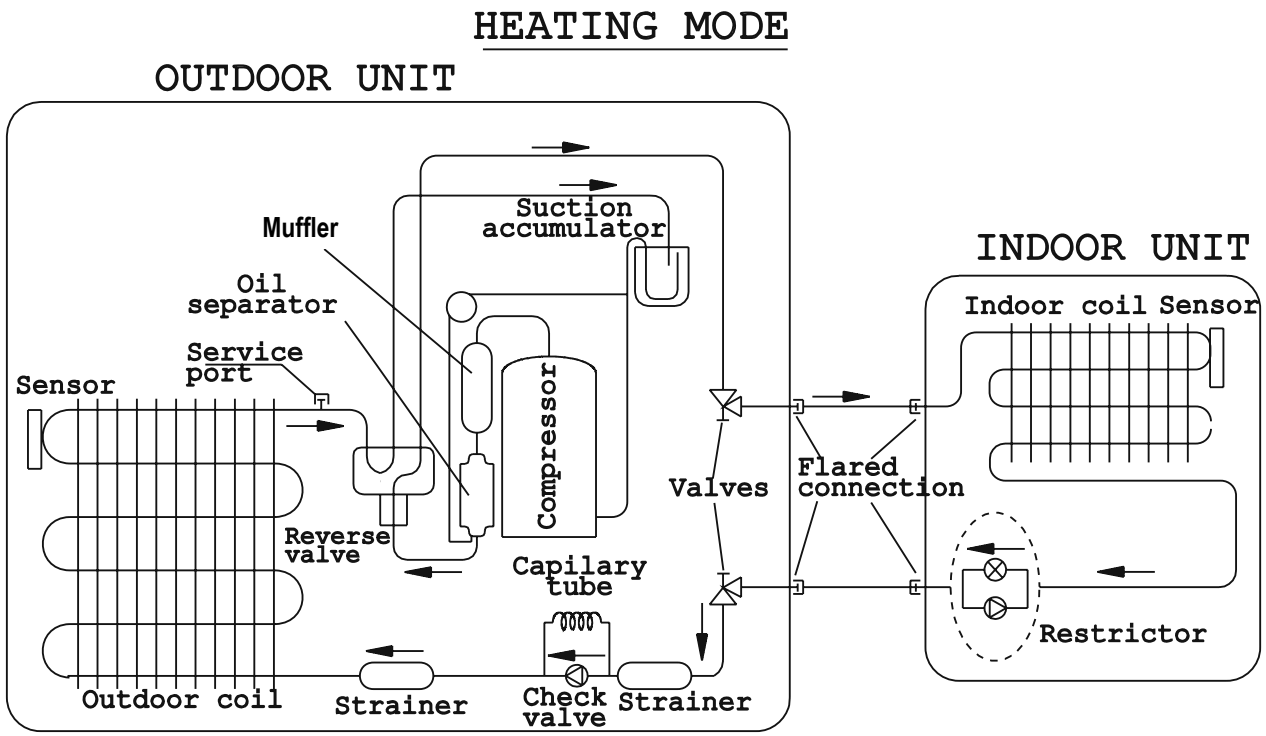
11.2.2 DLS 24 / GCN 24Z RC



11.3 Heat Pump Models

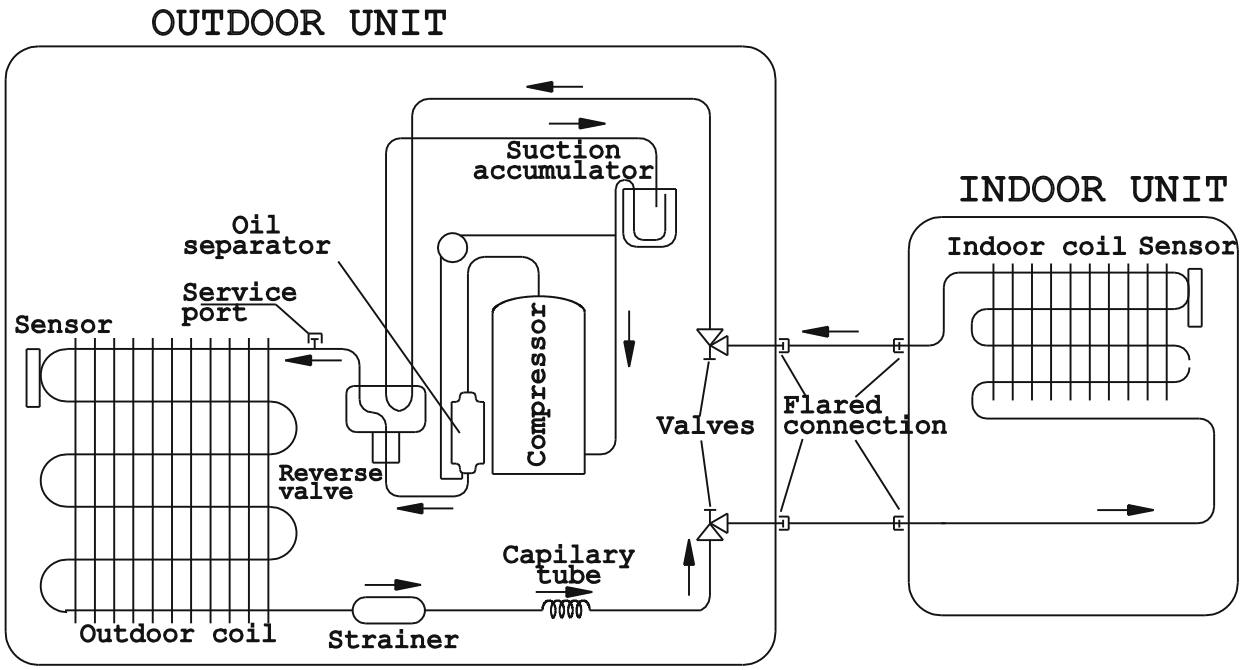
11.3.1 DLS 30 / GCN 30 RC, DLS 37 / GCN 37 RC



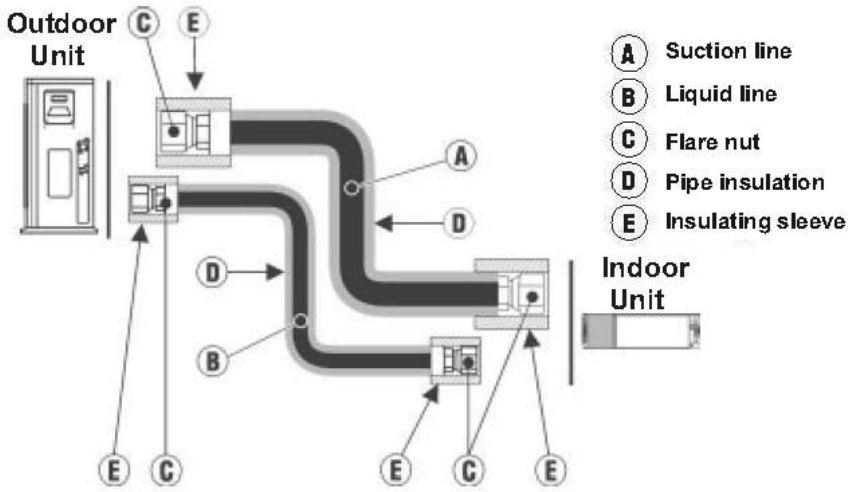


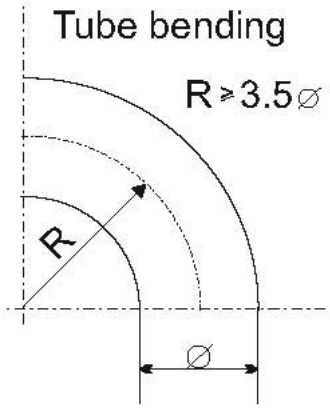
11.4 Cooling Model Only

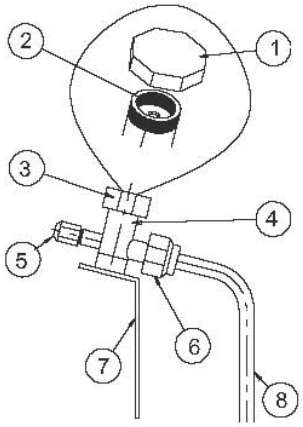
11.4.1 DLS 24, DLS 30, DLS 37, DLS 44 ST



12. TUBING CONNECTIONS





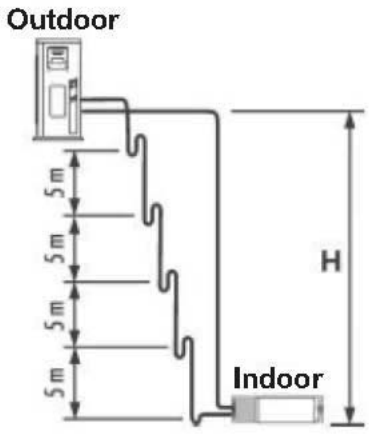


TUBE (Inch) / TORQUE (Nm)	1/4"	3/8"	1/2"	5/8"	3/4"
Flare Nuts	15-18	40-45	60-65	70-75	80-85
Valve Cap	13-20	13-20	18-25	18-25	40-50
Service Port Cap	11-13	11-13	11-13	11-13	11-13

1. Valve Protection Cap-end
2. Refrigerant Valve Port (use Allen wrench to open/close)
3. Valve Protection Cap
4. Refrigerant Valve
5. Service Port Cap
6. Flare Nut
7. Unit Back Side
8. Copper Tube

When the outdoor unit is installed above the indoor unit an oil trap is required every 5m along the suction line at the lowest point of the riser. Incase the indoor unit is installed above the outdoor, no trap is required.

*Applicable for DLS18 only, for DLS24 – 44 oil traps are not required.



13. CONTROL SYSTEM

13.1 Electronic Control

13.1.1 Introduction

The electronic control information is designed for service applications, and is common to the following groups of air-conditioners:

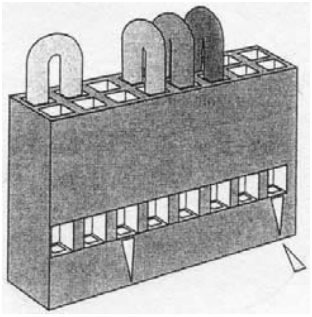
- **ST/RC** group -Cooling only / cooling and heating by heat pump.
- **SH group** -Cooling and heating by heat pump and supplementary heater.
- **RH group** -Cooling, heating by heaters only.

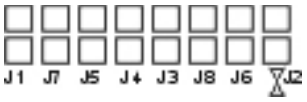
13.1.2 Model Plug Settings

Before installation, make sure to set the model plug conforming to the suitable group.

GROUP	**J6** Setting	**J2** Setting
ST / RC	Open	Open
SH	Closed	Open
RH	Closed	Closed

Model Plug





Group	Location of the jumpers
ST	
RC	
RH	
SH	

13.1.3 Remote Control DIP Switch Settings

SETTING SWITCH STATUS				DEFINITION	
SW. NO. 1	SW. NO. 2	SW. NO. 3	SW. NO. 4	RC3	RC4
OFF	OFF	--	--	RC-ALL MODES OF OPERATION	
ON	OFF	--	--	STD-COOL, FAN, DRY, ACTIVE	
OFF	ON	--	--	HEAT-COOL, FAN, DRY, ACTIVE	
ON	ON	--	--	AUTO FAN (AF)	
--	--	OFF	--	TEMP. DISPLAY IN °C DEGREES	VERTICAL SWING ONLY
--	--	ON	--	TEMP. DISPLAY IN °F DEGREES	HORIZONTAL & VERTICAL SWING FUNCTIONS TOGETHER
--	--	--	OFF	TIMER & CLOCK 12H AM, PM	DISABLE LCD & KEY ILLUMINATION
--	--	--	ON	TIMER & CLOCK 24H	ENABLE LCD & KEY ILLUMINATION

Reset operation **-** Press the 4 buttons simultaneously: “CLEAR “, “SET”, "HR +", ”HR -” for 5 seconds

LEGEND

SW1, SW2 - Selection of RC/ST
SW3 – Selection of Display °C or °F in RC3 or swing function in RC4
SW4 – Selection of Time Display 12H AM/PM or 24H in RC3 or illumination in RC4
OFF = 0
ON = 1

NOTE

After setting the DIP switches perform reset operation.

13.2 Abbreviations

AC	- Alternate Current
A/C	- Air-Conditioner
ANY	- ON or OFF status
CLOCK	- ON/OFF Operation Input, (dry contact)
COMP	- Compressor
CPU	- Central Processing Unit
HE	- Heating Element
HPC	- High Pressure Control
H/W	- Hardware
ICP	- Indoor Condensation Pump
ICT	- Indoor Coil Temperature (RT2) sensor
IF, I FAN	-Indoor Fan
IR	- Infra Red
LEVEL1	- Normal Water Level
LEVEL2/3	- Medium/High Water Level
LEVEL4	- Overflow Level
Max	- Maximum
Min	- Minimum
min	- Minute (time)
NA	- Not Applicable
OCP	- Outdoor Condensation Pump
OCT	- Outdoor Coil Temperature (RT3) sensor
OF, OFAN	- Outdoor Fan
OPER	- Operate
Para.	- Paragraph
RAT	- Return Air Temperature (RT1) sensor
RC	- Reverse Cycle (Heat Pump)
R/C	- Remote Control
RCT	- Remote Control Temperature
RH	- Resistance Heater
RT	- Room Temperature (i.e. RCT in I FEEL mode, RAT)
RV	- Reversing Valve
SB, STBY	- Stand-By
sec	- Second (time)
Sect	- Section
SH	- Supplementary Heater
SPT	- Set Point Temperature
ST	- Standard (a Model with Cooling Only)
S/W	- Software
TEMP	- Temperature
W/O	- Without
AT	- The difference between SPT and RT. in Heat Mode: AT = SPT-RT Cool/Dry/Fan Mode: AT = RT-SPT

13.3 General functions for all models

13.3.1 COMP operation

- For each Mode including POWER OFF & SB, a Min time delay of 3 min before COMP restarting, excluding DEICING Mode.
- The Min operation time of COMP under different operating conditions is

Operation Mode	Min operation time of COMP
Heat, Cool or Auto Modes	3 min.
Fan, Dry, Overflow, Protection modes, or mode change	ignored

13.3.2 IFAN operation

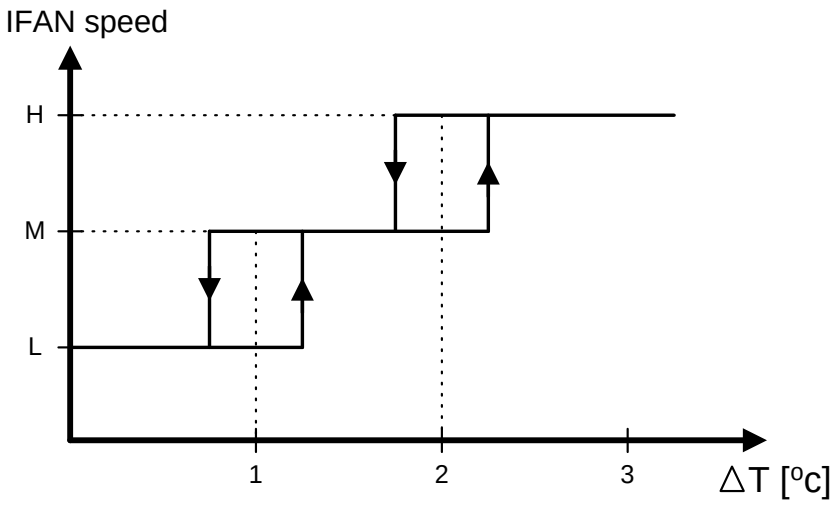
- Whenever the IFAN starts from OFF to ON it will start in Low speed for 25 sec and then will go to ANY speed.
- Min time interval between IFAN speed change in AUTOFAN Mode, is 30 sec.
- Min time interval between IFAN speed change in H/M/L Mode is 1 sec.
- IFAN speed in Heat/Cool Autofan Mode is determined according to the following table:

ΔT	IFAN Speed
$\Delta T \geq 2$	HIGH
$2 \geq \Delta T \geq 1$	MED
$1 \geq \Delta T$	LOW

where in Heat Mode: $\Delta T = SPT - RT$
in Cool Mode: $\Delta T = RT - SPT$

Note:

1. In Heat Mode, the rules in section 4.0.3 have the higher priority.
2. The table above can be represent by a hysteresis curve which will minimize the switching of the IFAN relay and will minimize the change in IFAN speed:



13.3.3 OFAN operation

- Min time interval between OFAN ON/OFF state change is 30 sec.

13.3.4 HE operation

- Minimum Heaters ON or OFF time is 30 sec.
- Heaters can be activated only if IFAN is on.
- In RH group, HE-1 and HE-2 will be activated only when COMP (or WVL) is not operating, except in Dry Mode.

13.3.5 Protections

- High pressure protection is applicable to all operating modes.
- Deicing control is valid in Heat and Auto Heat Mode only.
- Defrosting control is valid in Dry, Cool, Heat and Auto Modes.
- No reset after protection modes.

13.3.6 Thermistors operation

- Return air Temp. is detected by RAT (RT1) in normal Mode, or by RCT (R/C sensor) in I-FEEL Mode.
- Indoor Coil Temp. is detected by ICT (RT2).
- Outdoor Coil Temp. is detected by OCT (RT3).
- Similarly, in the Indoor Units of a WMQ/T system, 4.7k Ohm (5%) resistors must be connected to the OCT ports to disable the “Thermistor Temp reading doesn’t change” error checking.

13.3.7 Definition of thermistor faults:

a. Thermistor is disconnected - The thermistor reading is below -30^{o}c.

b. Thermistor is shorted - The thermistor reading is over 75^{o}c.

c. Thermistor Temp reading doesn’t change (irrelevant for RT1) -

I. This test is performed only once after a unit is switched from OFF/STBY to operation. At the first occurrence of 10 min continuous COMP operation, the current ICT & OCT are compared with those when the COMP was switched from OFF to ON 10 min before. If the ΔT is less than 3^{o}c, the thermistor is regarded as defective.

II. The ICT and OCT no-change error can be disabled together by connecting a 4.7 k or 3.9 k ohm resistor (5%) to the OCT connector. These resistors are equivalent to a thermistor at 43+/-1^{o}c and 48+/-1^{o}c respectively.

III. Cases for disabling thermistor short/disconnected detection

i. The detection of thermistor faults (a) and (b) above, are disabled when Deicer Protection is started. The detection will be enabled again only after the deicing is completed, and COMP has been restarted and operated for 30 sec.

ii. When all the following conditions are fulfilled:
   a. 4.7K Ohm resistor is connected on the OCT
   b. IFAN is OFF
   c. Compressor is ON
   d. ICT < -30 (disconnected)

IV. General features

1) Allowed (control target) range for RAT is SPT +/- 1°c.

2) Whenever the unit is changed from Cool/Dry/STBY mode to Heat mode or vice versa, the procedures below are followed:

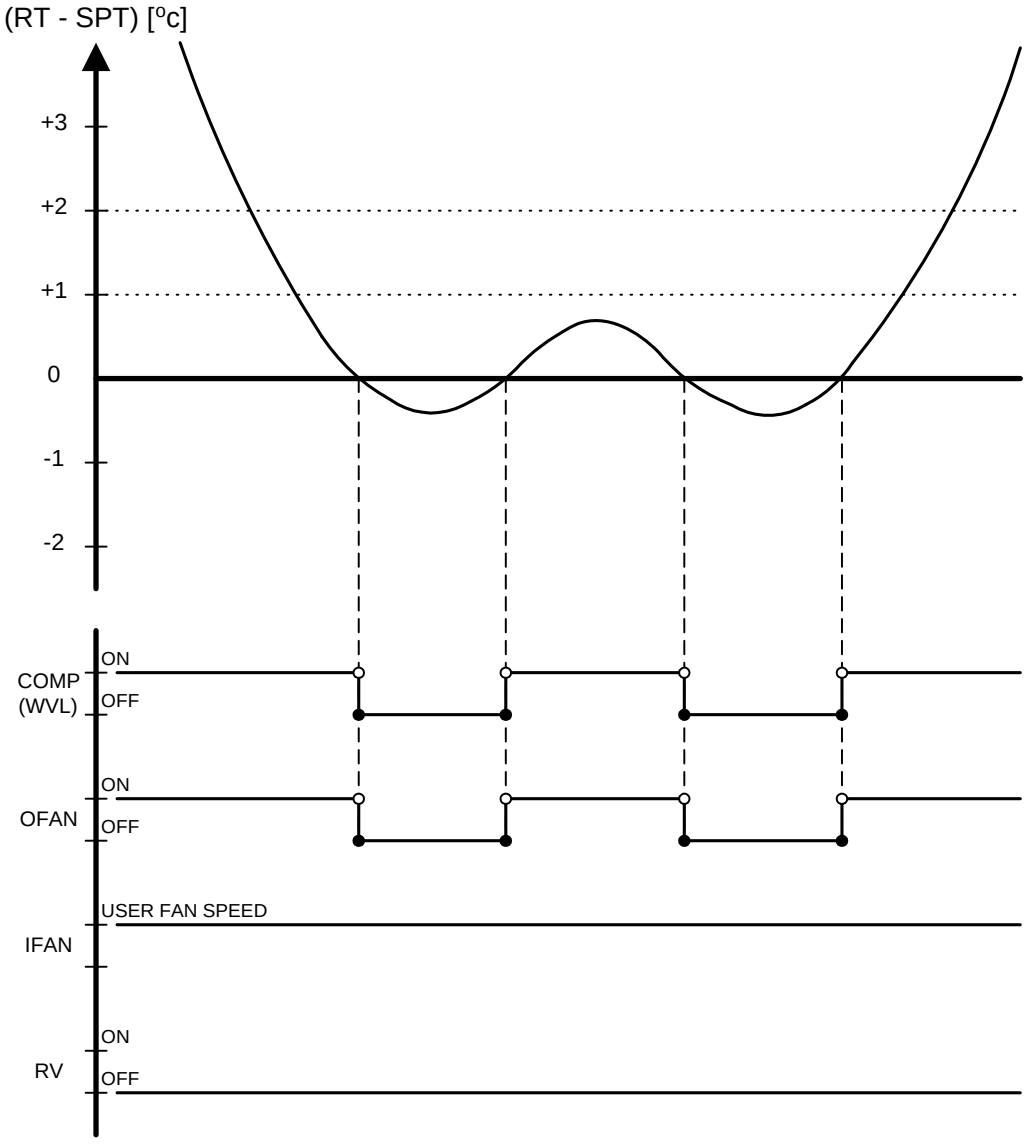
   Stop COMP for 3 min → Change RV state → Start COMP if necessary.

13.4 Cooling

Mode: Cool, Auto (at Cooling)
Temp: Selected desired temperature.
Fan: HIGH, MED, and LOW
Timer: Any
I Feel: On or Off

Control function

Maintains room temp at desired level by comparing RT and SPT.



Note:

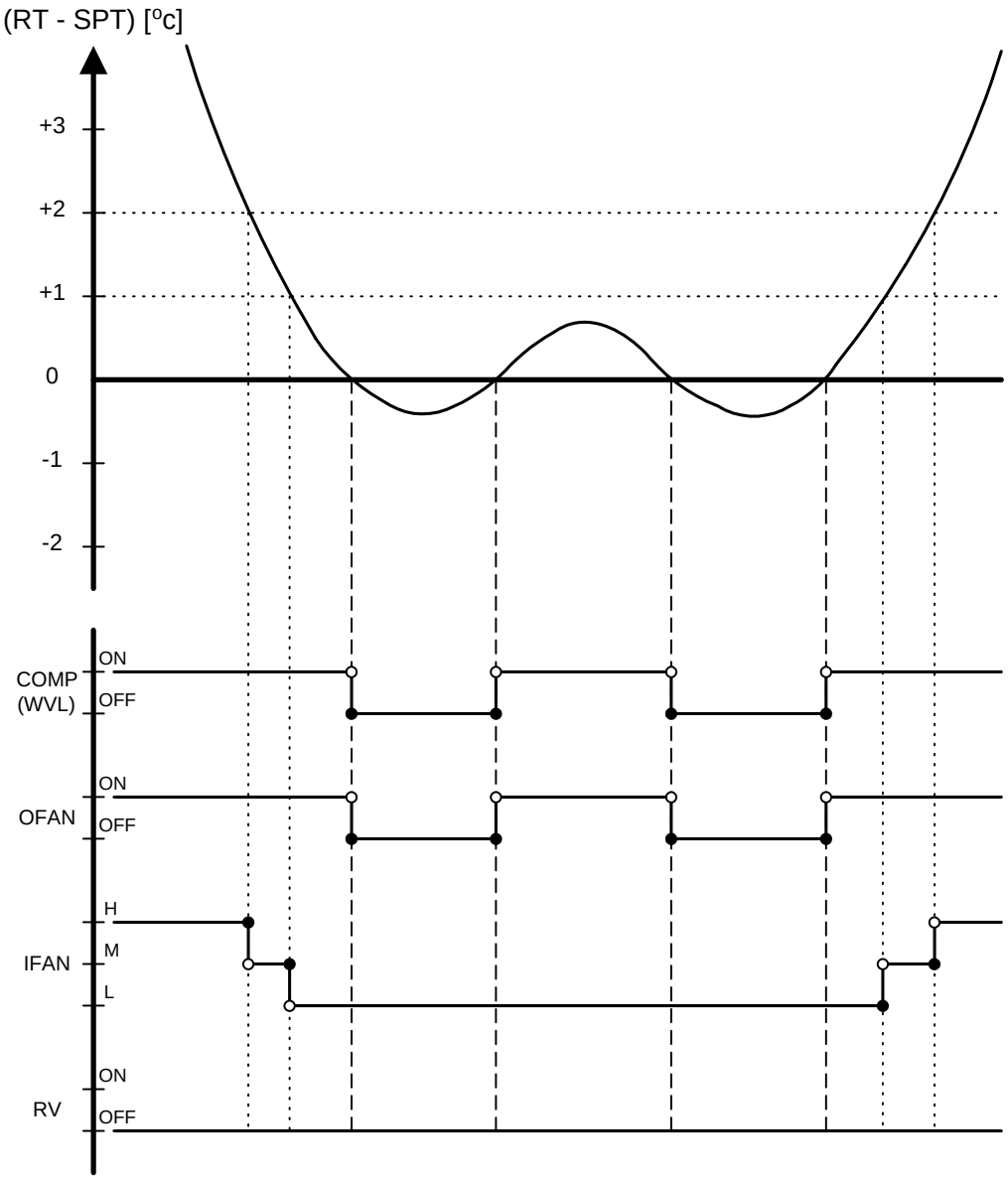
1) IFAN is always running at High, Medium or Low speed selected by user.
2) In IFEEL mode, the Room Temperature (RT) is the RCT from an R/C. Otherwise, the RT is the RAT from the Room Thermistor.

13.4.1 Cooling with Autofan

Mode: Cool, Auto (at cooling)
Temp: Selected desired temperature
Fan: Auto
Timer: Any
I Feel: On or Off

Control function

Maintains room temp at desired level and controls the IFAN speed for optimal comfort.



13.5 Heating Mode

13.5.1 Heating Mode - General

In heating Mode, temp. compensation schedule will be activated for wall mounted and ducted models (i.e. FCD/RWK, ELD, ECC, WAX, WMF and WMN/WHX) according to the following table:

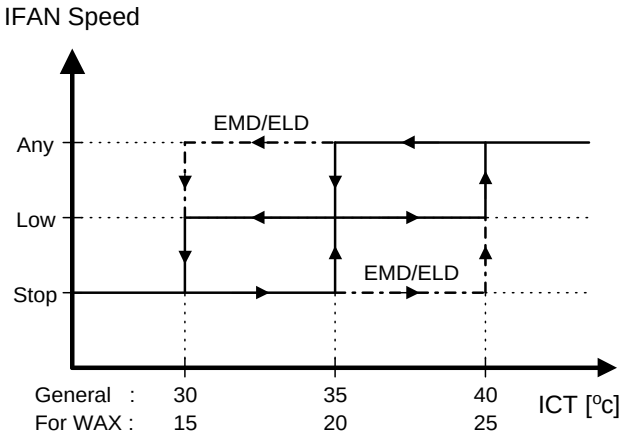
SPT [°c]	Add to SPT	
	I-FEEL ON	I-FEEL OFF
18 ≤ SPT ≤ 27	0 °c	+2 °c
27 < SPT ≤ 30	0 °c	+3 °c

13.5.2 IF operating rules

(a) As a general rule for **RC and SH groups**, when **COMP is ON**, excluding protection modes, IFAN will be switched ON if

- ICT > 35°c (or 40°c for EMD/ELD, 20°c for WAX), or
- at the IFTC second (4) after the COMP is switched ON. In this case, the IFAN will be started at low speed (5). The default IFTC values are:

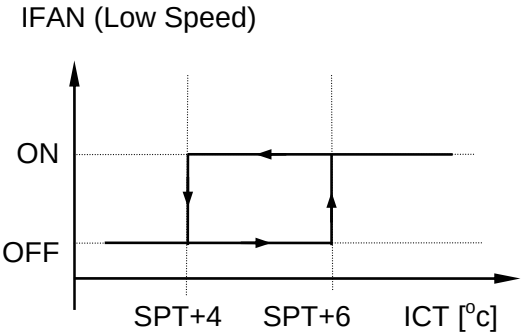
0 sec	for EMD/ELD models
15 sec	for WMN4/RWK(FCX) models
600 sec	for WVL (including IFC) models
30 sec	for all other models



Notes :

1) In EMD/ELD models, the IFAN will start if ICT ≥ 40°c at any IFAN speed, and will stop if ICT < 30°c.
2) In **SH or RC group**, if HE is set to OFF due to low ICT, IFAN will be switched to LOW and will be turned OFF after 30 sec.
3) An exception to this rule) is the Back-up mode for SH group. 4) If the IFAN is turned ON by the IFTC operation, its minimum operation time before stopping due to low ICT temperature is 60 sec.

(b) In **RC and SH groups**, whenever **COMP & HE are both OFF**, excluding protection modes, IFAN operation will be according to the following:
In **WAX, flour mounted or mobile models**, IFAN switches to LOW for 30 sec and then stops.
In **other models** IFAN will operate in low speed for 30 sec and then stop. If COMP is OFF for more than 3 minutes and IFEEL Mode is inactive, IFAN will operate in low speed according to the following graph:



(c) In **RH group**, IFAN starts when HE starts. When HE switches to OFF, IFAN switches to LOW for 30 sec and then stops.

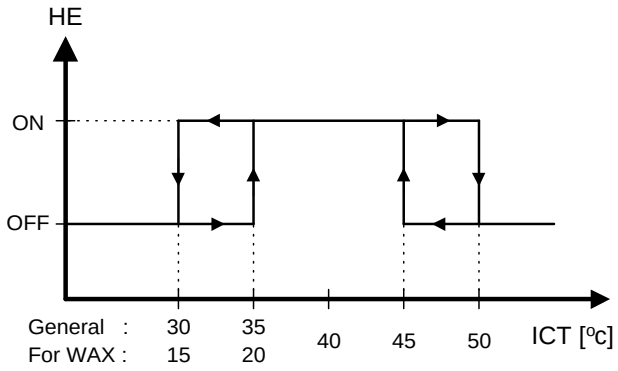
13.5.3 HE operation

(a) For **all Groups**, HE can be ON only when IFAN is ON.

(b) For **all Groups**, HE switches to OFF when ICT > 50 °c, and is activated again when ICT ≤ 45°c.

(c) In **RH group**, HE operation is according to the difference between RAT and SPT (see Sect 4.3, 4.4).

(d) In **SH or RC group**, HE operation is limited by the following graph:



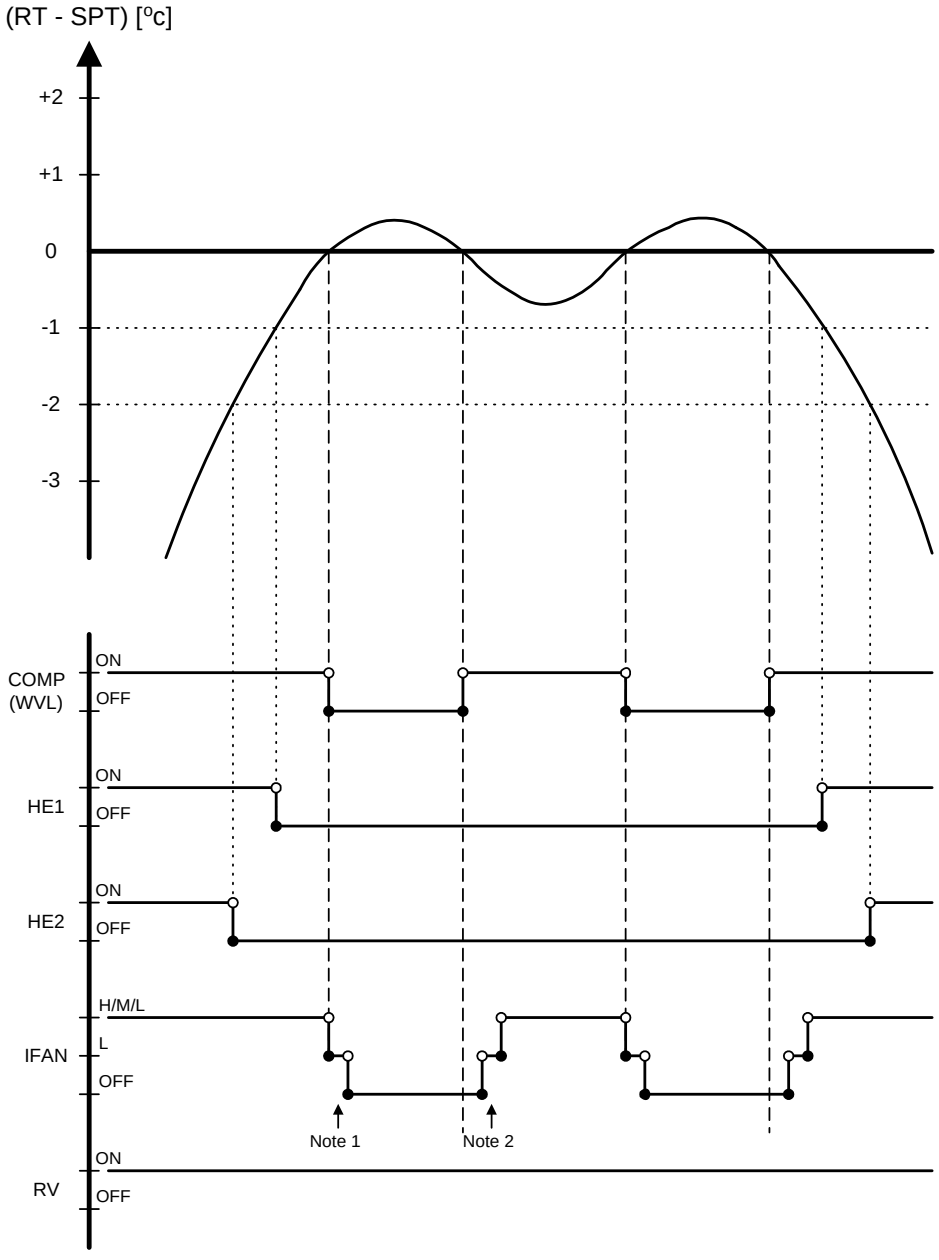
(f) Back-up mode for **SH group**

After COMP (or WVL) has been working for 5 minutes, HE & IFAN are activated even if the ICT is still below 35°c. This situation is called Back-up Mode. Both HE & IFAN will work in Back-up Mode until the ICT reaches 35°c. Then, the operation goes on in the usual mode (IFAN as in 4.0.3.a, and HE as in 4.0.4.d).

13.5.4 Heating, RC or SH Group

Mode: Heat, Auto (at heating)
Temp: Selected desired temperature
Fan: HIGH, MED, LOW
Timer: Any
I Feel: On or Off

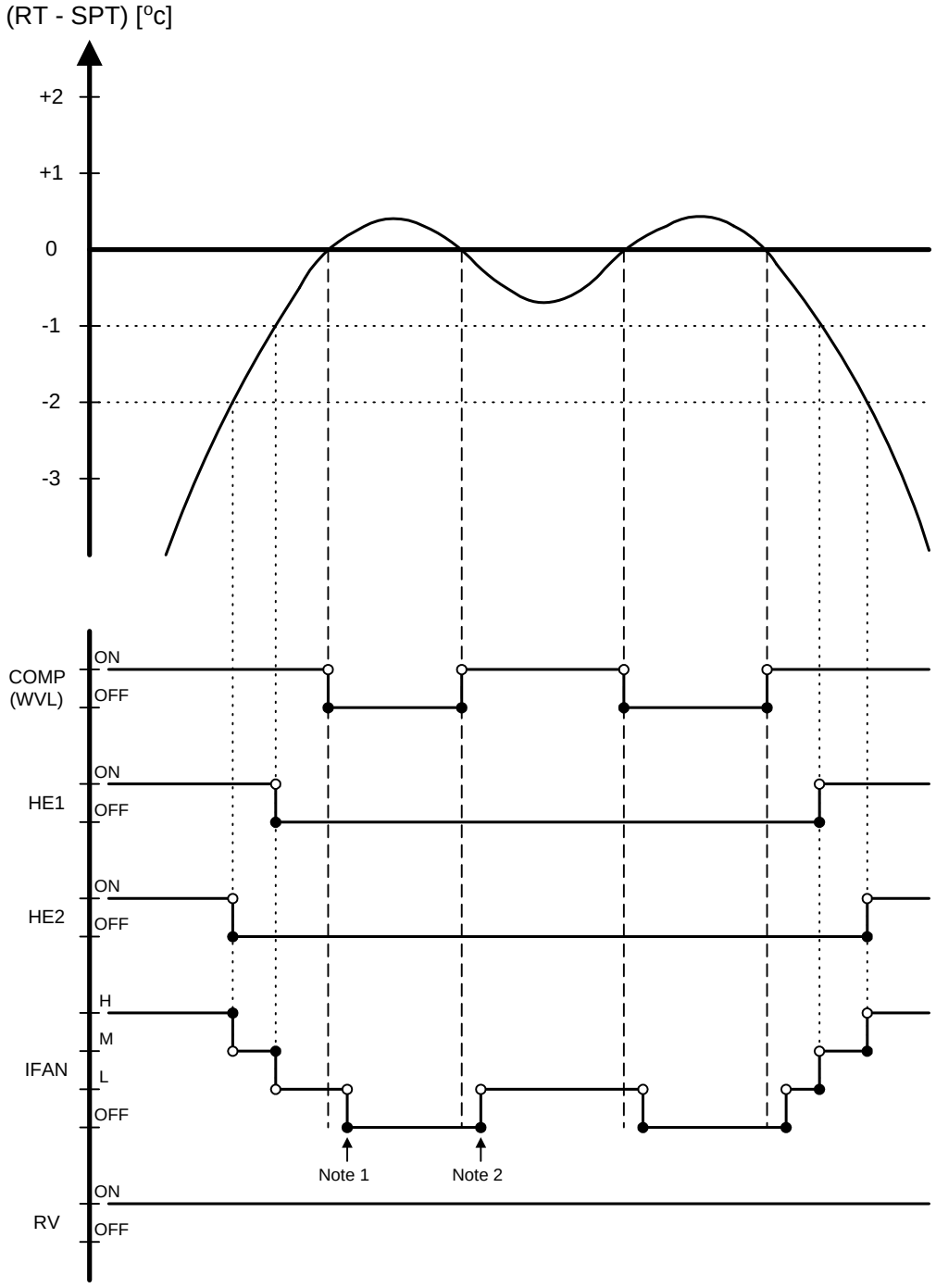
Control function
Maintains room temp. at desired level by comparing RAT or RCT to SPT.



13.5.5 Heating, RC or SH Group with Autofan

Mode: Heat, Auto (at heating)
Temp: Selected desired temperature
Fan: Auto
Timer: Any
I Feel: On or Off

Control function
Maintains room temp at desired level by controlling COMP, IFAN and OFAN.



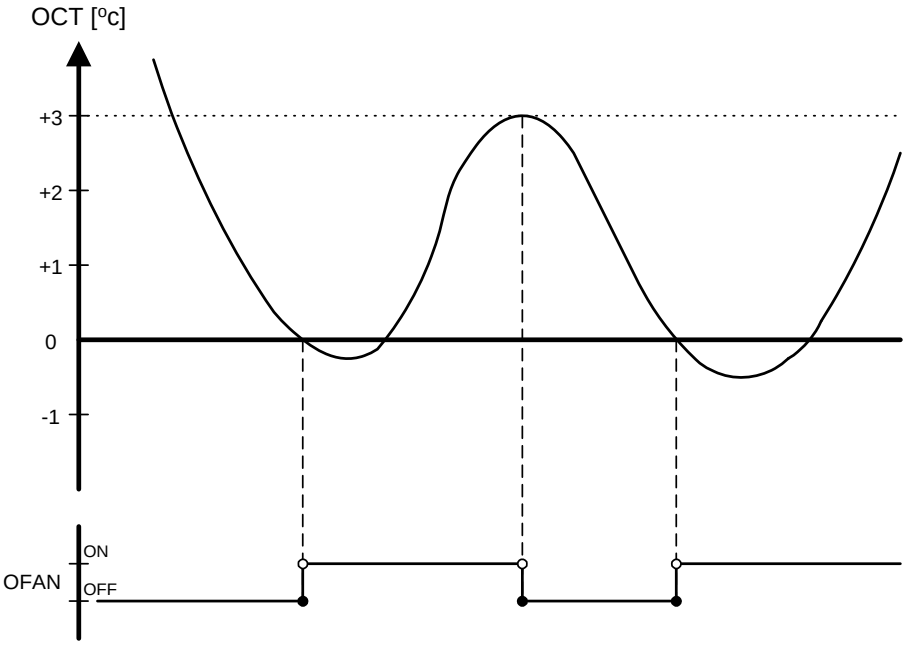
13.5.6 OFAN operation is controlled by the graph below when

א (RAT ≥ SPT – 2°c), AND

ב (ICT ≥ 45°c), AND

ג (COMP is ON)

Otherwise, OFAN runs together with COMP.

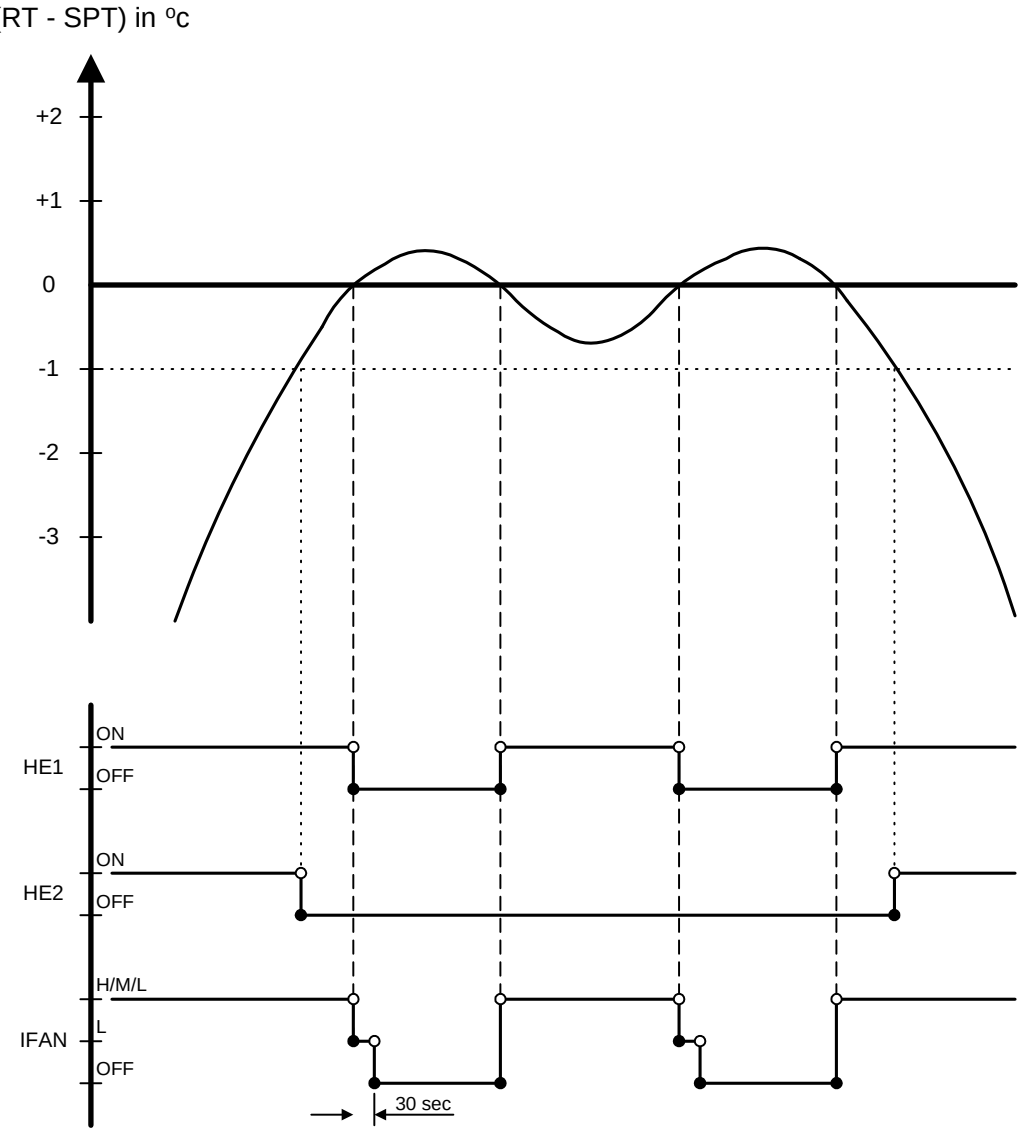


13.5.7 Heating, RH Group

Mode: Heat, Auto (at Heating)
Temp: Selected desired temperature
Fan: HIGH, MED, LOW
Timer: Any
I Feel: On or Off

Control Function

Maintains room temp. at desired level by controlling Heating Elements : HE1 or HE2.



Notes:

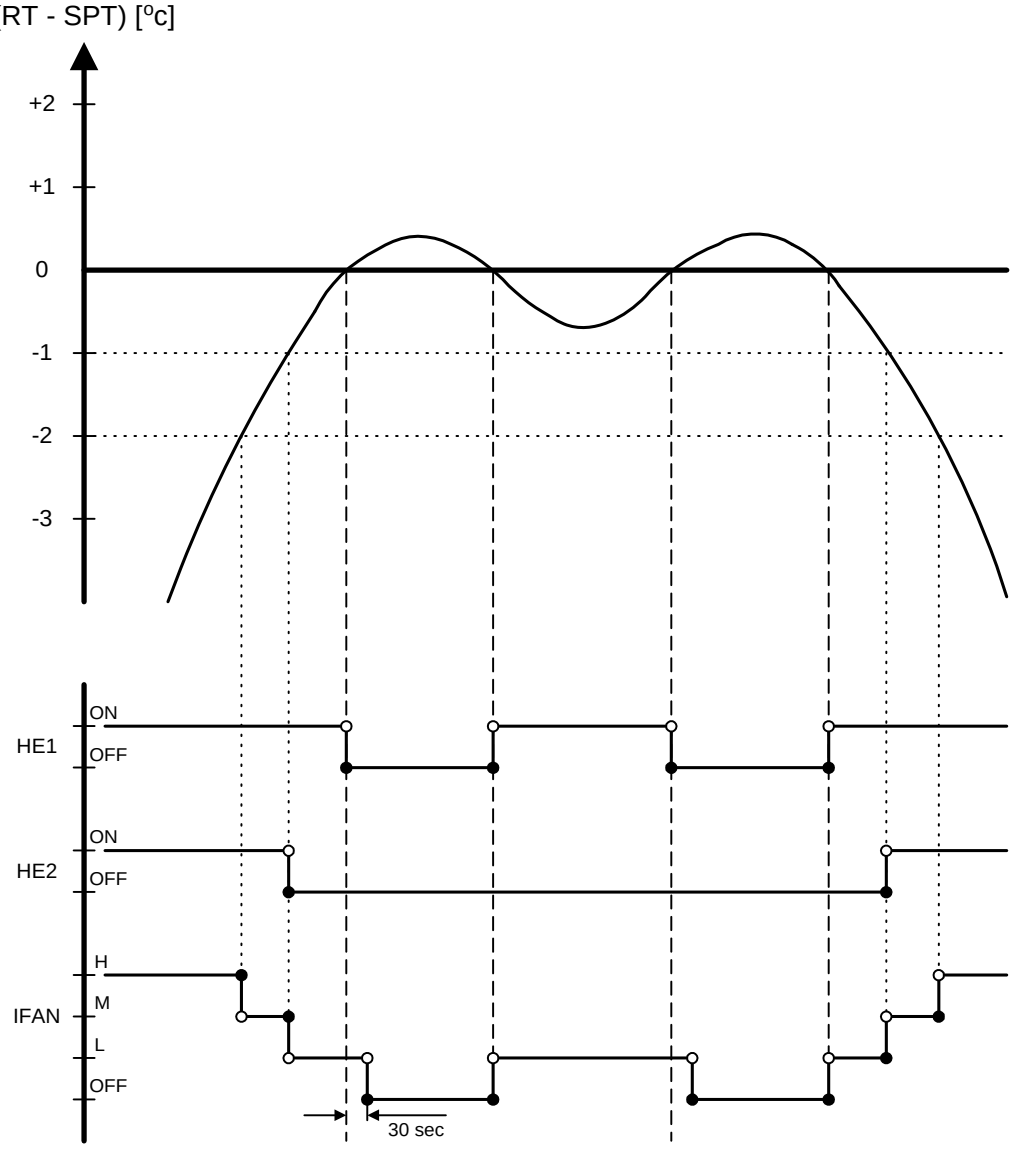
1) COMP (or WVL), OFAN and RV are always OFF.

13.5.8 Heating, RH Group, with Autofan

Mode: Heat, Auto (at Heating)
Temp: Selected desired temperature
Fan: Auto
Timer: Any
I Feel: On or Off

Control function

Maintains room temp at desired level by controlling the 2-Stage Electric Heaters.



Notes:

1) COMP (or WVL), OFAN and RV are always OFF.

13.6 Automatic Cooling or Heating - General

13.6.1 The Auto Mode is for model with compressor and the WVL-RH only. The WVL-ST, RC and SH units do not work in Auto Mode.

- Switching-temperature between Cooling and Heating is SPT $\pm$ 3°c.

- Autofan in Automatic Cooling and Heating Mode will activate “Cooling with Autofan Mode” and “Heating with Autofan Mode” respectively.

- When the Auto Mode is started with SPT +/-0°c, the unit will not select Auto Heat or Auto Cool mode immediately. Instead, the unit will be in a temporary Fan Mode with IFAN operating at low speed. The proper Auto Heat mode or Auto Cool will be started whenever the RT reaches SPT-1°c or SPT+1°c respectively.

- For RC & SH units, Mode change between Auto Heat & Auto Cool Modes is possible only after the COMP has been OFF during the last T minutes.

Mode Change	time, T
Auto Cool to Auto Heat	3 min
Auto Heat to Auto Cool	4 min

- For RH units, Mode change between Auto Heat & Auto Cool Modes is possible after the COMP/HEs have been OFF during the last T minutes.

Mode Change	time, T
Auto Cool to Auto Heat	COMP off for 3 min
Auto Heat to Auto Cool	HEs off for 3 min

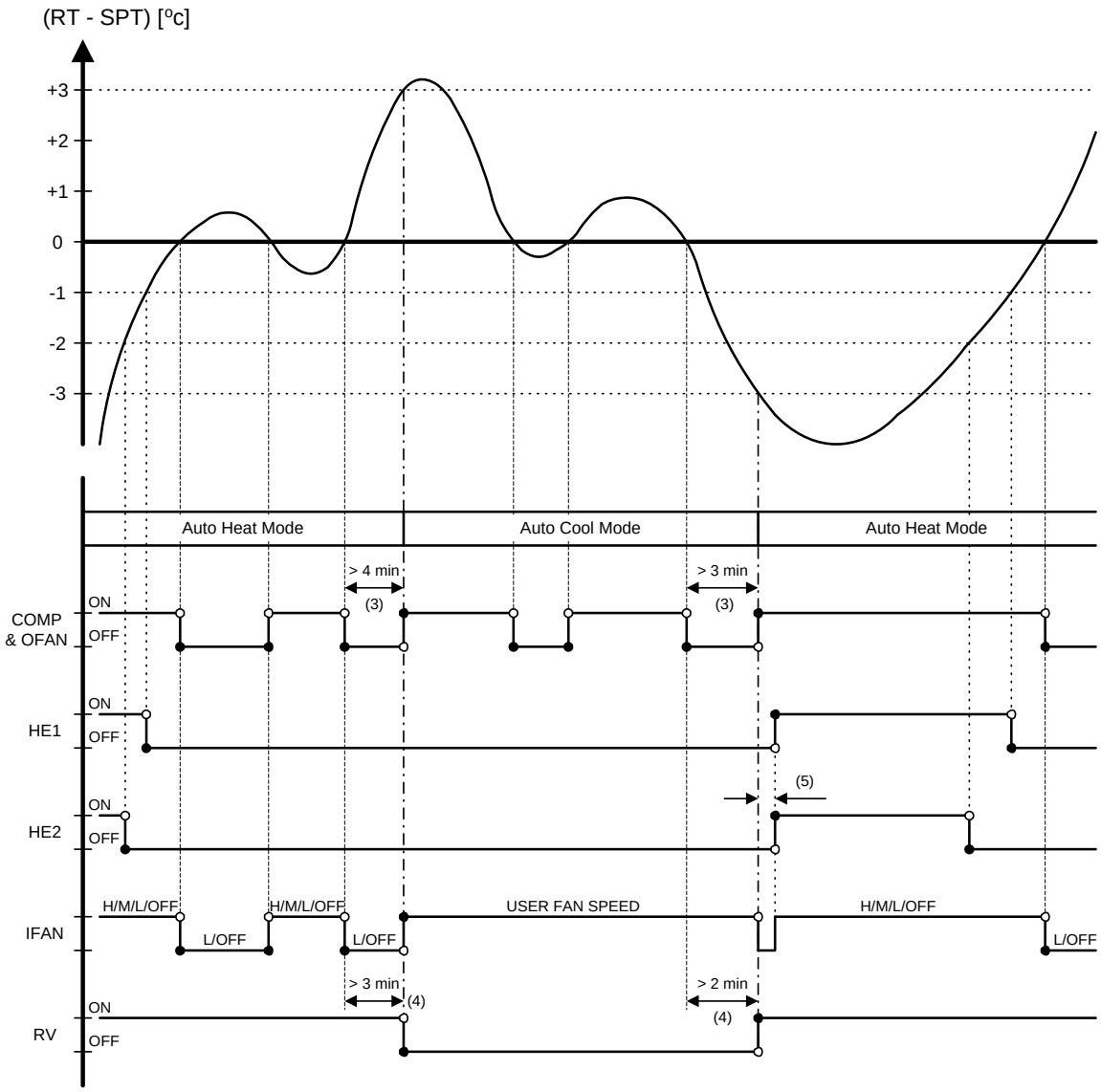
- When unit is changed form Cool/Dry mode to Auto Mode, the unit will continue to operate at (Auto) Cool Mode until the conditions for switching from Auto Cool to Auto Heat are satisfied.

  Similarly, when unit is changed from Heat Mode to Auto Mode, the unit will continue to operate at (Auto) Heat Mode until the conditions for switching from Auto Heat to Auto Cool are satisfied.

13.6.2 Auto Cooling or Heating, RC or SH Groups

Mode: Auto
Temp: Selected desired temperature
Fan: Any
Timer: Any
I Feel: On or Off

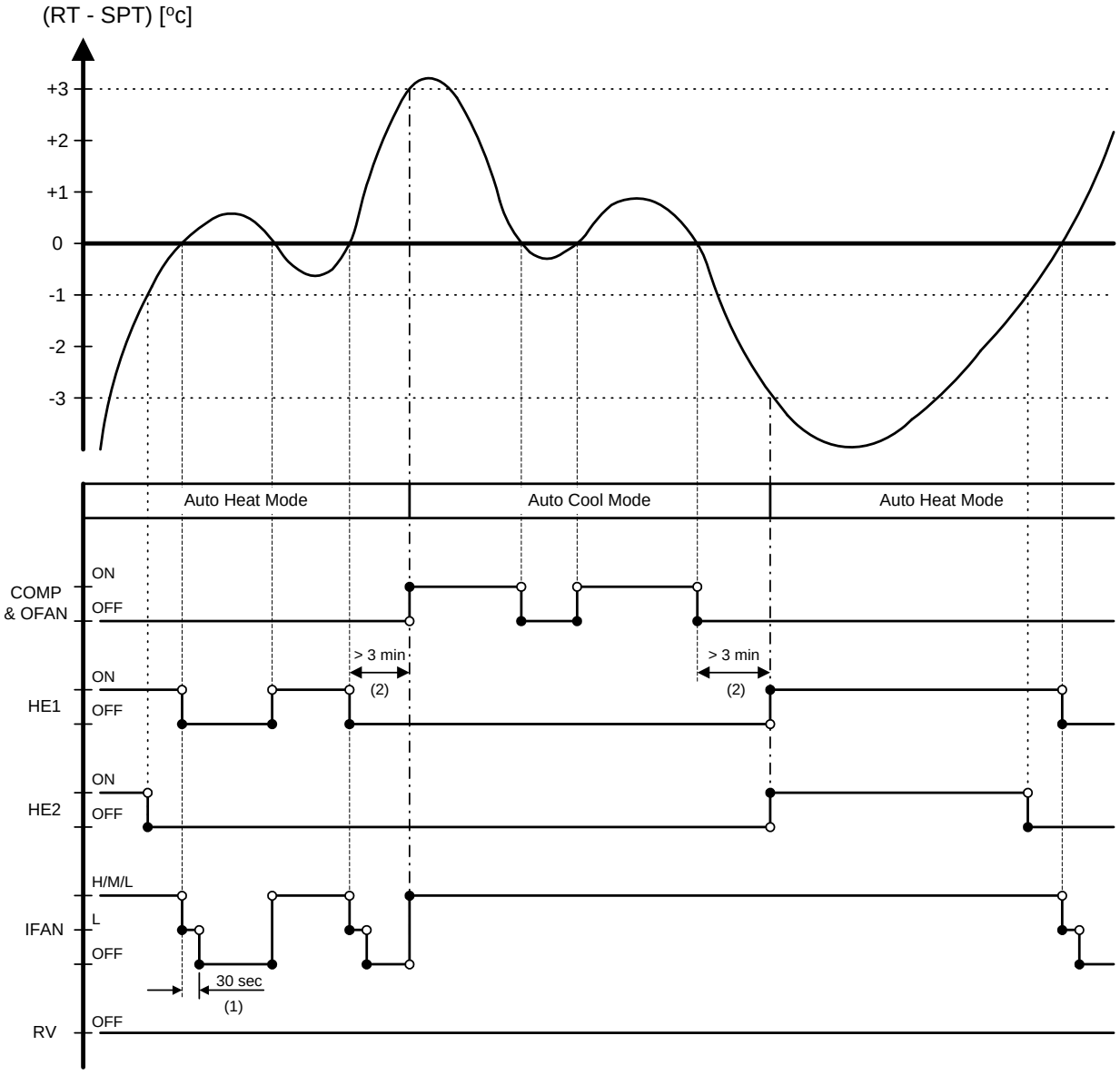
Control function
Maintains room temp at desired level by selecting between cooling and heating modes.



13.6.3 Auto Cooling or Heating RH Group

Mode: Auto
Temp: Selected desired temperature
Fan: Any
Timer: Any
I Feel: On or Off

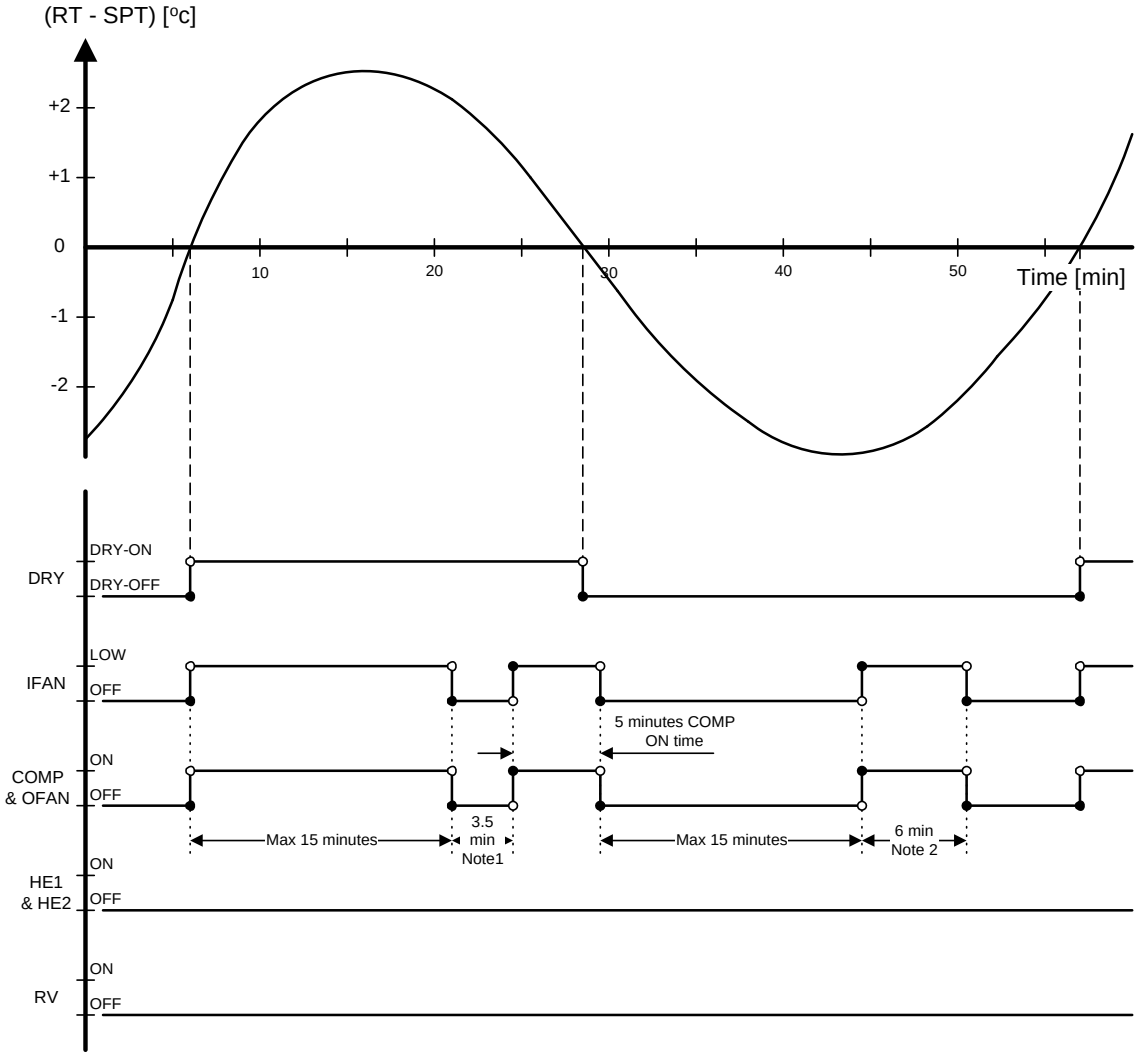
Control function
Maintains room temp at desired level by selecting between Cooling or Heating Modes.



3.7 Dry, ST or RC group or P2000 model with any group settings

Mode: Dry
Temp: Selected desired temp
Fan: Low (automatically selected by software)
Timer: Any
I FEEL:Any

Control function
Reduce room humidity with minimum temp. fluctuations by operating in Cool Mode with low speed IFAN.



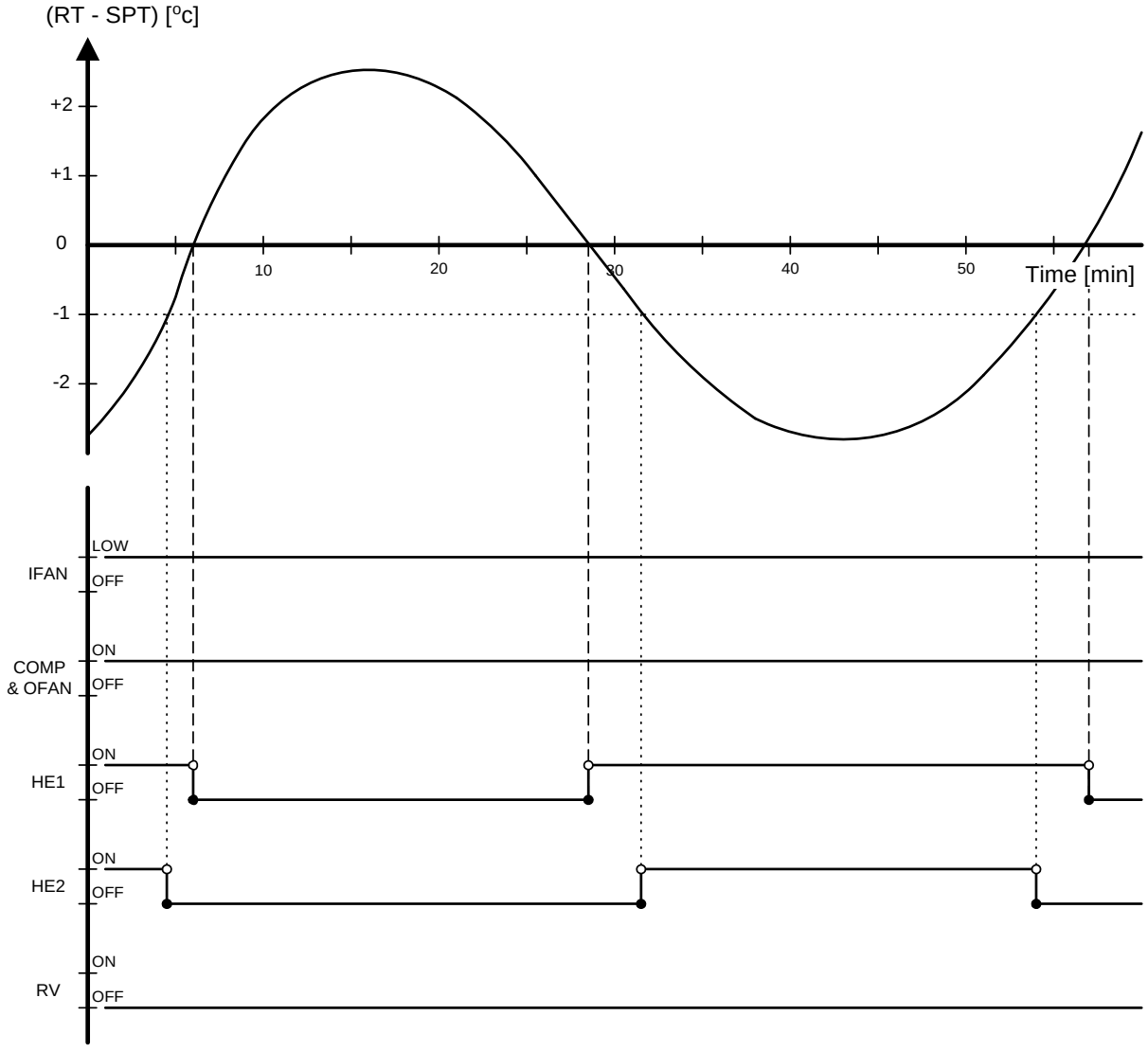
Notes :

1. When Dry is ON, the COMP is forced OFF for 3.5 min (longer than the 3 min Min COMP-Off time) after every 15 min of continuous COMP operation.
2. When Dry is OFF, the COMP is forced ON for 6 min (longer than the 3 min Min COMP-On time) after every 15 min of continuous COMP OFF time.
3. When Dry is changed from ON to OFF or vice versa, the limits mentioned in (1) & (2) are ignored. The COMP operation is only controlled by the 3 min Min OFF time and 1 min Min ON time.
4. In Dry Mode, IFAN is LOW when COMP is ON, and is OFF when COMP is OFF.
5. HEs are always OFF in Dry Mode.

13.7.1 Dry, SH or RH group excluding P2000 model

Mode : Dry
Temp: Selected desired temp.
Fan: Low (automatically selected by software)
Timer: Any
I FEEL: Any

Control function
Reduce room humidity with minimum Temp. fluctuations by operating in Cool Mode with low speed IFAN and HE.



Notes :

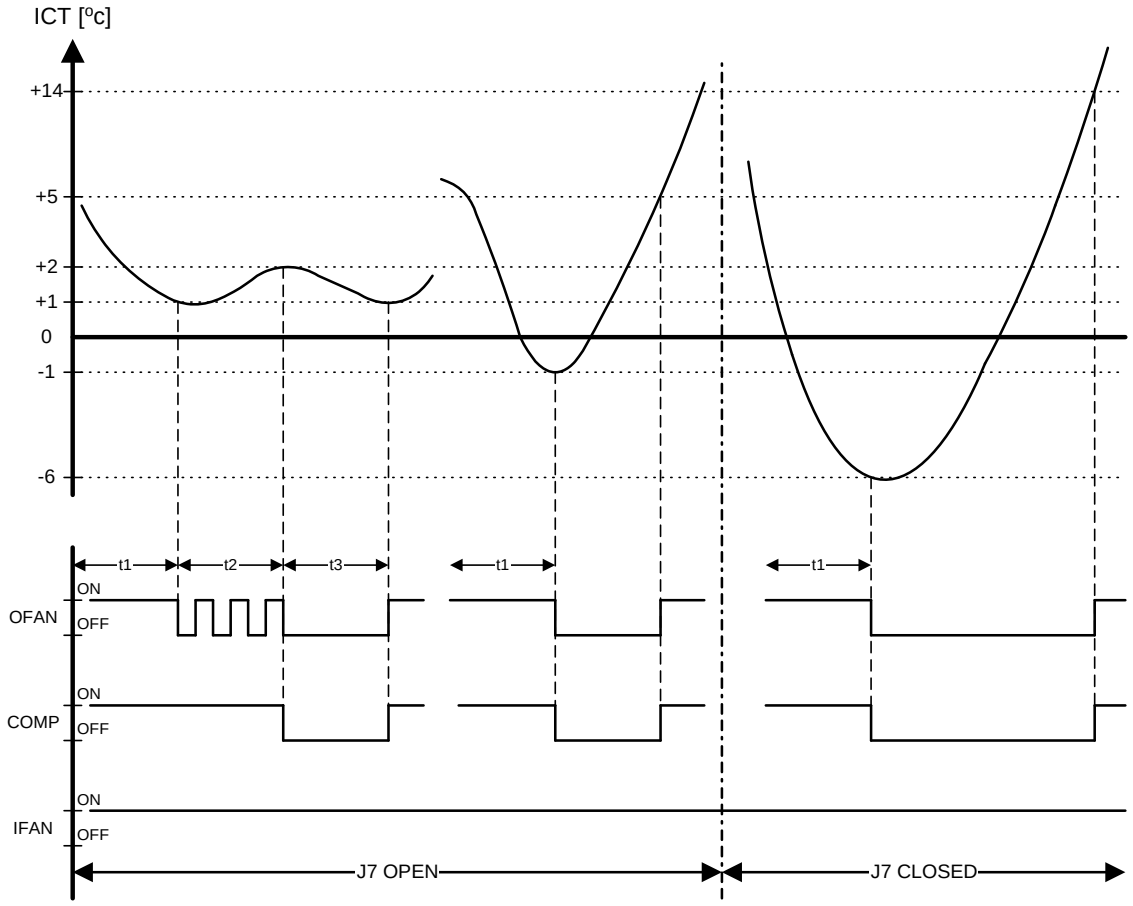
1) HP and Defrost protections are the same as in Cool Mode.
2) HEs are operated according to the room temp., in the same way as in Heating for RH group .
3) IFAN is operating continuously at low speed.

13.8 Cooling Mode Protections

13.8.1 Indoor Coil Defrost

Mode: Cooling, Dry, Auto
Temp: Selected desired temp.
Fan: Any
Timer: Any
I Feel: On or Off

Control Function
Protect the indoor coil from ice formation at low ambient temperature.



t1 = 5 min minimum for each COMP starting
t2 = OFAN cycling (alternate between ON and OFF every 30 sec) for 20 min maximum
t3 = COMP and OFAN stop for 10 min minimum

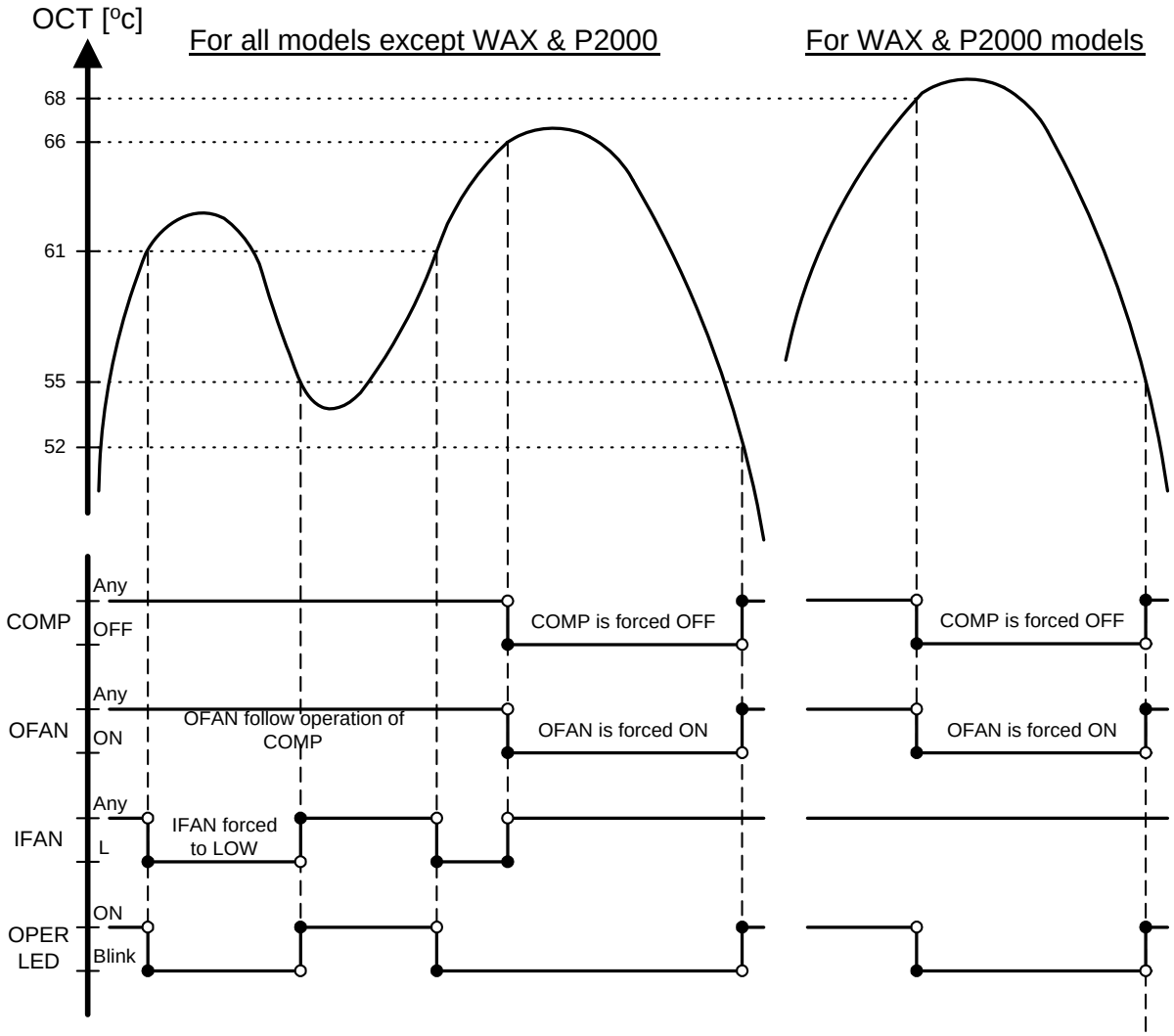
Notes:

1. When J7 is closed (connected), OFAN cycling is cancelled and the set temperature for COMP & OFAN cut-out and cut-in are changed. COMP & OFAN are forced OFF when ICT =< -6°c, and are kept OFF until ICT > 14°c.
2. For WAX model, the defrost processes is simpler. When J7 is open, COMP & OFAN are forced OFF when ICT =< -1°c, and are kept OFF until ICT > 5°c. When J7 is closed, the WAX defrosting process is the same as that of the other models (R.H.S. of the graph above). In both cases, the ICT checking in t2 and t3 are not applied.

13.8.2 High Pressure Protection

Mode: (Auto) Cooling or Dry
Temp: Selected desired temp.
Fan: Any
Timer: Any
I Feel: On or Off

Control Function
To protect the COMP from the high pressure built-up in the outdoor coil during normal cooling operation, by switching OFF the IFAN and COMP.



Note:

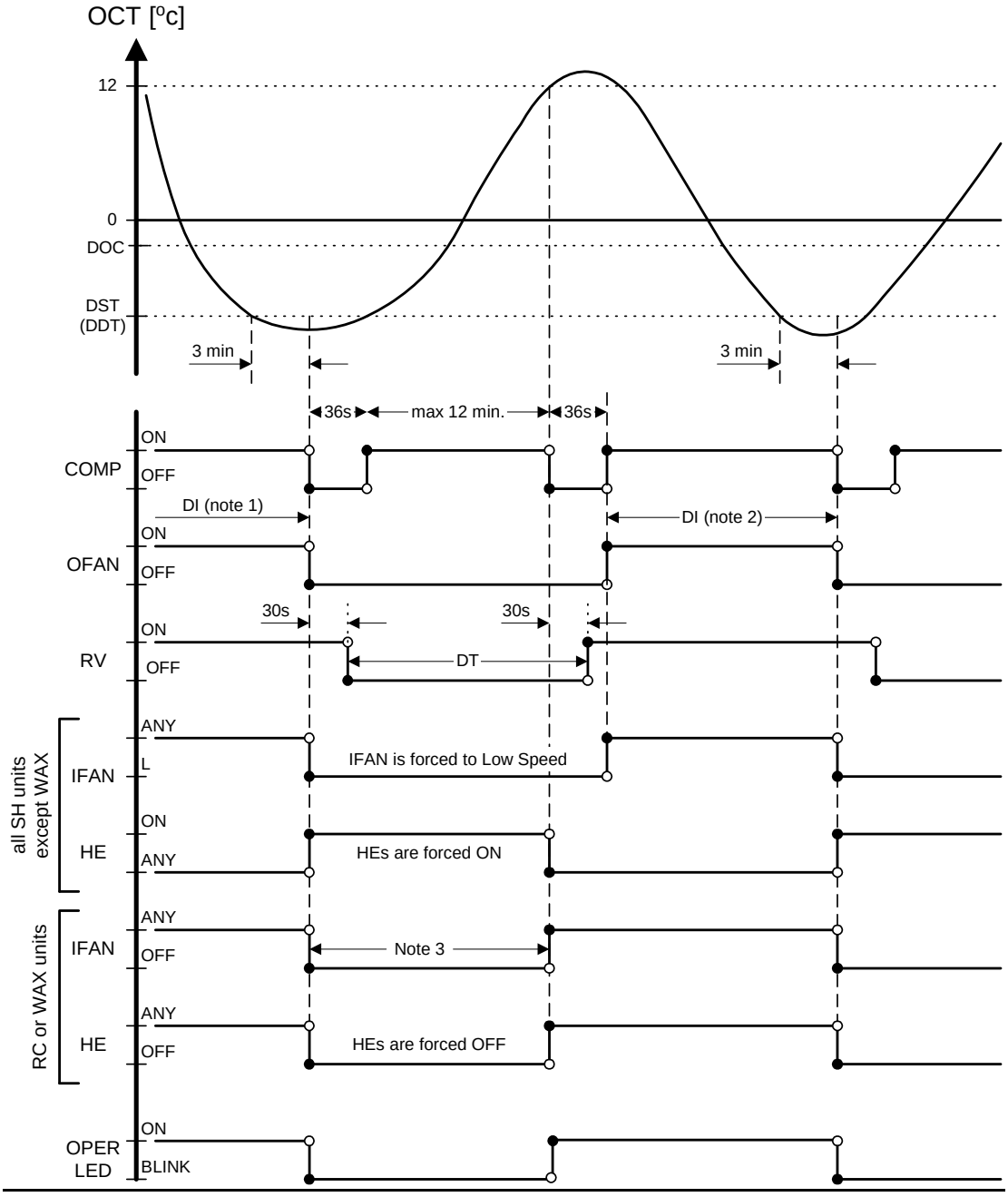
1. The ICT is also monitored during Cool and Dry mode, in case the RV control circuit is faulty. Whenever ICT reaches 70°c, which indicates a high pressure in the indoor coil, the COMP will be forced off automatically. The COMP can be turned on again only after the ICT is under 70°c again and after the 3 min COMP ON delay time. The OPER LED will not blink in this case.

13.8.3 Outdoor coil Deicing (excluding RH Group)

Mode: Heating, Auto (at heating)
Temp: Selected desired Temp
Fan: Any
Timer: Any
I FEEL: Any

Control function

Protects the Outdoor coil from ice formation by controlling COMP & RV operation.
Deicing procedure:



Notes :

1. At the first COMP activation after SB or OFF, if (OCT < 0°c), then DI = 10 min, else DI = 40 min.
2. In the following Deicing cycles, the time interval between two Deicing cycles activation is between 30 to 80 min (refer to the flow chart).

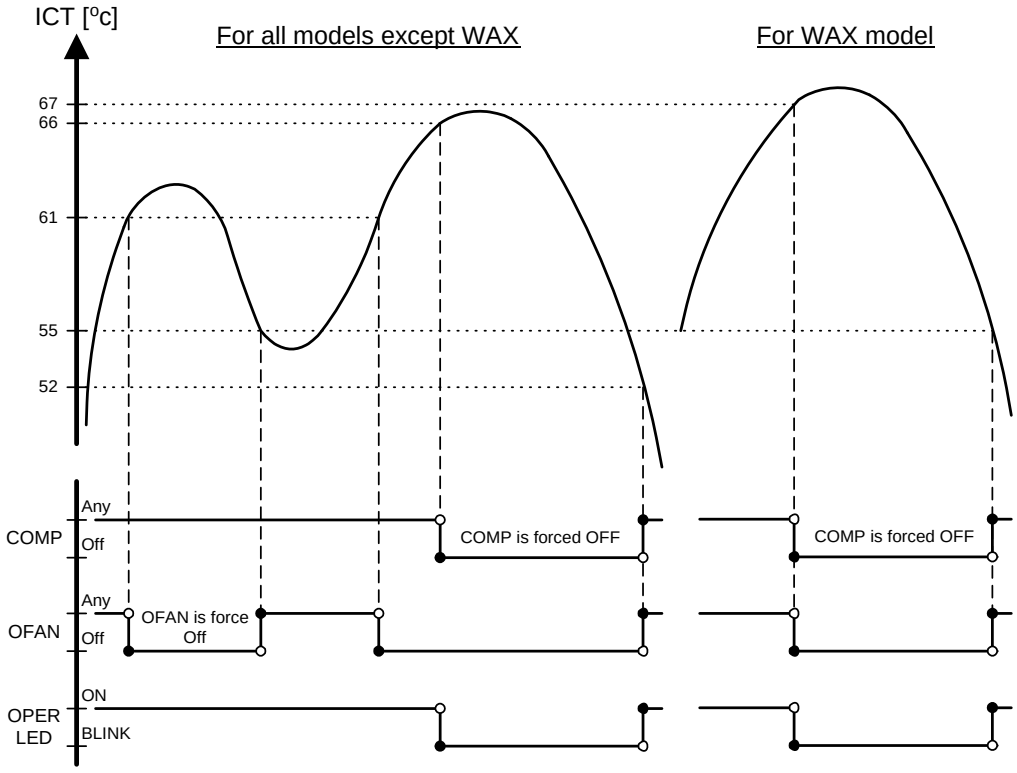
1. For RC group, HEs are forced OFF. IFAN operation is as in Heat Mode,. IFAN will be set to OFF when ICT<30°c.
   For WAX, the IFAN is simply forced OFF.
3. For SH group, HEs are forced ON and IFAN is forced to operate in Low speed, regardless of the ICT and difference between RAT & SPT.

13.8.4 .High pressure protection (excluding RH Group)

Mode: (Auto) Heating
Fan: Any
Timer: Any
I Feel: On or Off

Control Function

Protect the Compressor from high pressure by switching OFF the OFAN and COMP.



Notes:

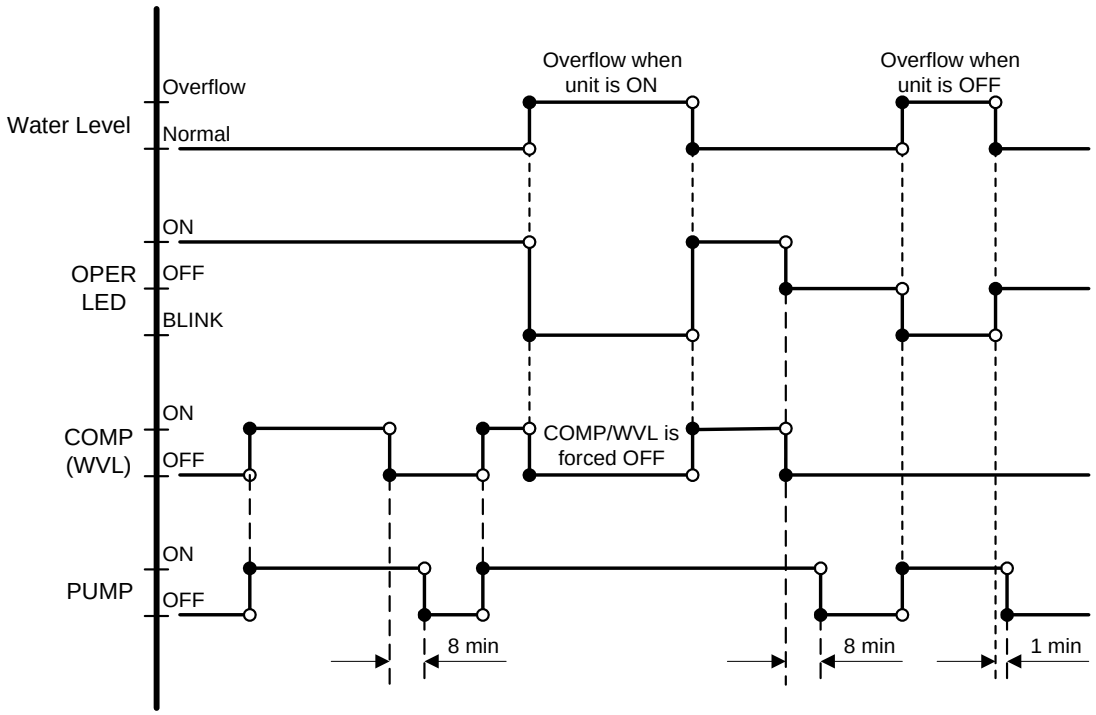
1. IFAN, HE1 and HE2 will be activated according to the relevant Heating Mode Sect.
2. In case of any malfunction in the relay control circuit, the OCT is also monitored during heating mode. Whenever OCT reaches 70°c, which indicates a high pressure in the outdoor coil, the COMP will be forced off automatically. The COMP can be turned on again only after the 3 min COMP ON delay and the OCT is under 70°c. The OPER LED will not blink in this case.

13.8.5 Condensation Pump (DNC model only)

Mode: Cool, Dry, Auto
Temp: Selected desired temperature
Fan: Any
Timer: Any
I FEEL: Any

Control function:

Prevent Condensed water from Overflowing.



Notes:

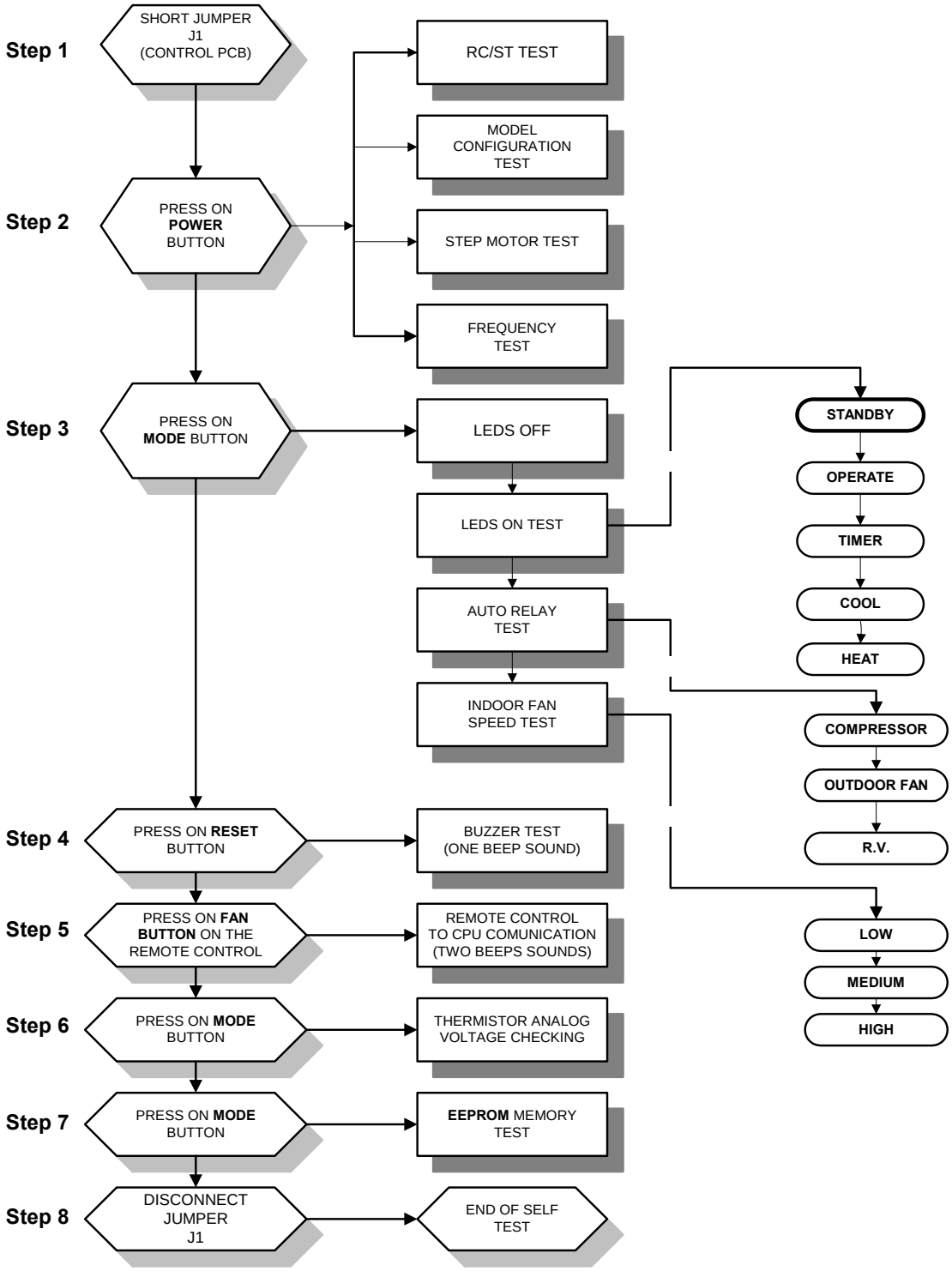
1. The switch used for water level detection is closed under normal condition, and is open when water overflow.
3. The "Over Flow" & “Normal” condition are indicated by logic “1” & “0” at the LEVEL4 input pin respectively.
4. The “Overflow” condition can activate the water pump in SB and operating modes.

13.9 Controller Self-Test Procedure

13.9.1 By Shorting Test Jumper J1

SELF-TEST FLOW CHART

FOR CONTROLLER (VERSION 4V5 OR HIGHER)



13.9.2 By Remote Control Settings:

a. STEP 1: TURNING ON THE POWER.
Turn ON the power, make sure that the unit is in operation.

b. STEP 2 : ENABLE SELF-TEST MODE

1) Use the remote control to send the first settings to display / indoor unit HEAT mode, HIGH IFAN, set temperature to 16 ºC**,** no I-FEEL Sleep or any other timer settings are needed.

2) Cover the IR transmitter components in the remote control so that it will not transmit the signals to the indoor unit display.

3) Use the remote control to send the second settings to display / indoor unit COOL mode, LOW IFAN, no I-FEEL Sleep or any other timer settings.

4) Uncover the remote control IR transmitter and change the temperature settings. If the display/indoor unit receive the settings properly the following steps will start:

c. STEP 3: MODEL SETTING CONFIRMATION

1) The STAND-BY and COOL LEDS will indicate the operation mode as follows:

OPERATION MODE	STAND-BY LED	COOL LED
ST	ON	OFF
RC	OFF	OFF
SH	OFF	ON
RH	ON	ON

2) Testing the Model configuration. Selected by the COMP, STAND-BY, TIMER LEDS and FILTER will indicate the model configuration as follows (the relevant line for this manual is highlighted):

MODEL	COMP	OPERATE LED	TIMER LED	FILTER LED
WNG	ON	OFF	OFF	OFF
MBX	ON	OFF	OFF	ON
WNX	ON	OFF	ON	OFF
PRX	ON	ON	OFF	OFF
WMN1	ON	ON	OFF	ON
EMD/LS	ON	ON	ON	OFF
K/DNC/DNG	ON	ON	ON	ON
WMN 4	OFF	OFF	ON	OFF
PXD	OFF	OFF	ON	ON
WMN 2/WHX	OFF	ON	OFF	ON
WMN 3	OFF	ON	ON	ON

In this term the step motor will turn to HOME POSITION.

d. STEP 3: AUTO LED WALK TEST.

1) All the LEDS will turn OFF.

2) All the LEDS will turn ON for 1 second one by one in the following sequence:

STAND-BY ⇨ OPERATE ⇨ TIMER ⇨ FILTER ⇨ COOL ⇨ HEAT.

3) In PRX all the LEDS will turn ON for 1 second one by one in the following sequence : 18 °c ⇨ 20 °c ⇨ 22 °c ⇨ 24 °c ⇨ 26 °c ⇨ 28 °c ⇨ 30 °c ⇨ High IFAN ⇨ Auto IFAN ⇨ Med IFAN ⇨ Low IFAN ⇨ STAND-BY⇨ TIMER ⇨ FILTER ⇨COOL⇨ HEAT.

e. STEP 4: AUTO REALY WALK TEST:

All relays will energize one by one in the following sequence:

COMPRESSOR ⇨ OUTDOOR FAN⇨R. V. ⇨ HEATER 1 ⇨ HEATER 2 ⇨ INDOOR WATER PUMP ⇨ SWING or OUTDOOR WATER PUMP ⇨ INDOOR FAN: LOW ⇨ MID ⇨ HIGH.

When the relay walk test is completed, the next test will start automatically.

f. STEP 5: FREQUENCY TESTING:

If the frequency measuring process fails the COOL LED will turn ON. In order to move to the next step, press ON/OFF button on the remote control.

g. STEP 6: INPUT TEST.

The test purpose is to check the analog real time indicators (thermistors, LEVEL and clock) according to the table below.

LED Indicator	Condition for LED to be ON
STBY LED	Room thermistor ≠ 25°c
OPER LED	Indoor coil thermistor ≠ 25°c
TIMER LED	Outdoor coil thermistor ≠ 25°c
FILTER LED	Clock
COOL LED	LEVEL 2&3
HEAT LED	LEVEL 4

h. STEP 7: TIMING RESET TEST (WATCH DOG).

The test purpose is to verify that the CPU rise time after power failure is between 1 to 3 sec, test results are indicated on the LEDS : STAND-BY,OPER, TIMER and FILTER turning ON one by one.

The results of the test are coded as follows:

Pass condition:

1 sec - STAND-BY and OPER are turned ON

2 sec - STAND-BY, OPER and TIMER are turned ON

Fail condition:

0 sec - STAND-BY is turned ON

3 sec - STAND-BY, OPER, TIMER and FILTER are turned ON

When the timing reset test is completed, the next test will start automatically.

i. STEP 8: MEMORY TEST (EEPROM)

The test purpose is to check if the memory is functioning correctly. The test result is reported by using the STAND-BY and FILTER LEDS:

LED Indicator	Condition for LED to be ON
STAND-BY LED	Test passed
FILTER LED	Test failed

AT THIS POINT THE SELF-TEST IS COMPLETED.

In order to terminate Self-Test mode the User can change the unit setting from COOL Mode, LOW FAN to COOL Mode, MED FAN or to wait without using the remote control for 60 sec.

Values of Sensors Temperature VS. Voltage (DC)

Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)
-20	4,554	2	3.744	24	2.555	46	1.487
-19	4,529	3	3.695	25	2.5	47	1.447
-18	4,502	4	3.646	26	2.445	48	1.409
-17	4,475	5	3.595	27	2.391	49	1.371
-16	4.446	6	3.544	28	2.338	50	1.334
-15	4.417	7	3.492	29	2.284	51	1.298
-14	4.386	8	3.439	30	2.232	52	1.263
-13	4.354	9	3.386	31	2.18	53	1.228
-12	4.322	10	3.332	32	2.128	54	1.195
-11	4.287	11	3.278	33	2.077	55	1.162
-10	4.252	12	3.223	34	2.027	56	1.13
-9	4.216	13	3.168	35	1.978	57	1.099
-8	4.178	14	3.113	36	1.929	58	1.069
-7	4.14	15	3.058	37	1.881	59	1.04
-6	4.1	16	3.002	38	1.834	60	1.011
-5	4.059	17	2.946	39	1.798	61	0.983
-4	4.017	18	2.89	40	1.742	62	0.956
-3	3.974	19	2.833	41	1.698	63	0.929
-2	3.93	20	2.777	42	1.654	64	0.904
-1	3.885	21	2.722	43	1.611	65	0.879
0	3.839	22	2.666	44	1.569	66	0.854
1	3.792	23	2.61	45	1.527	67	0.831

13.10 System Diagnostics

Pressing Mode button for 5-10 seconds in SB or any other operation mode will activate the DIAGNOSTICS mode, acknowledged by 3 short beeps and lighting of COOL and HEAT LEDs.
In DIAGNOSTICS mode, system failures will be indicated by the blinking of HEAT & COOL LEDs.
The coding method is as follows:

- HEAT LED blinks 5 times in 5 seconds, and then turns off for the next 5 seconds.
- COOL LED blinks during the same 5 seconds according to the following table:

No.	Problem	1	2	3	4	5
1	RT1 is disconnected	○	●	●	●	●
2	RT1 is shorted	○	●	●	●	○
3	RV fault	○	●	●	○	●
4	RT2 is disconnected	●	○	●	●	●
5	RT2 is shorted	●	○	●	●	○
6	(Reserved)	●	○	●	○	●
7	RT2 temp reading doesn't change	●	○	●	○	○
8	RT3 is disconnected	●	●	○	●	●
9	RT3 is shorted	●	●	○	●	○
10	(Reserved)	●	●	○	○	●
11	RT3 temp reading doesn't change	●	●	○	○	○
12	RT2 & RT3 temp reading doesn't change	●	○	○	○	○

LEGEND

○ - ON, ● - OFF

NOTES

1. If faults occur in more than one thermistor (except case number 12 in table above), only one fault will be indicated according to the following order: RT3, RT2, RT1.
2. A/C will return to normal mode when sending a command by the R/C during system DIAGNOSTICS mode. If the command from the R/C contains a Group ID, the ID will become the new Group ID of the ELCON unit.

14. TROUBLESHOOTING

ELECTRICAL & CONTROL TROUBLESHOOTING

ATTENTION: check for broken or loose cable lugs first.

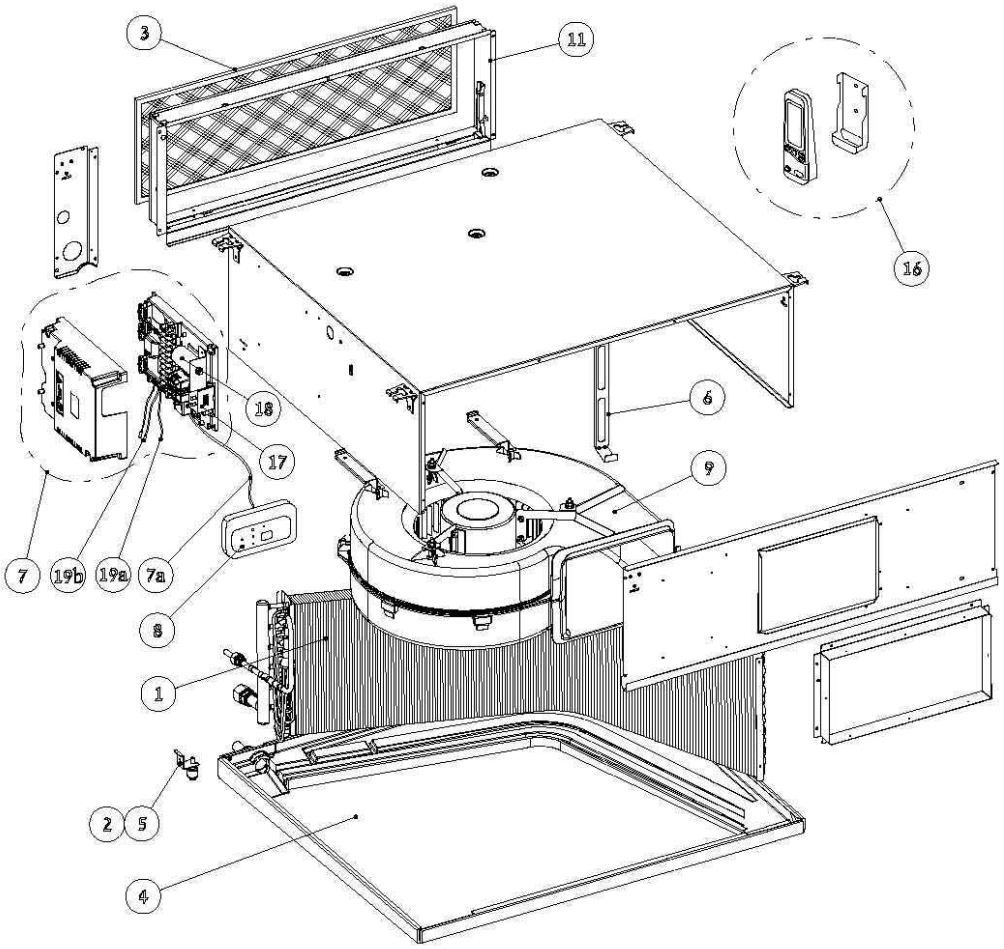
NO	SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
1.	The stand-by indicator (red led) on the central control display panel doesn't light up.	There is no correct voltage between the line and neutral terminals on main P.C.B.	-If the voltage is low repair power supply. -If there is no voltage repair general wiring. -If there is correct voltage replace main or display P.C.B'S
2.	The operation indicator (green led) on the central control display panel does not light up.	The remote control batteries are discharged	-Replace batteries of the remote control
3.	The operation indicator (green led) does not light up when starting from unit.	Check main P.C.B and display P.C.B.	-Replace P.C.B if necessary.
4.	The indoor fan does not function correctly.	Check the voltage between indoor fan terminals on the main P.C.B.	- If there is voltage replace capacitor or motor.
5.	The outdoor fan does not function correctly.	Check the voltage between outdoor fan terminals on the main P.C.B. There is voltage between outdoor fan terminals on the outdoor unit. There is no voltage between outdoor fan terminals on the outdoor unit.	- If there is no voltage replace main P.C.B - Replace capacitor or motor. - Check and repair electrical wiring between indoor and outdoor units.
6.	The compressor does not start up.	Check voltage on compressor terminals on the outdoor unit. (with ammeter) Check if there is correct voltage between compressor terminals on the outdoor unit.	-If no voltage replace main P.C.B. - If low voltage repair power supply. -If the voltage correct replace capacitor or compressor. -If there is no voltage repair electrical wiring between indoor and outdoor units.
7.	The refrigeration system does not function correctly.	Check for leaks or restrictions, with ammeter, pressure gauge or surface thermometer.	- Repair refrigeration system and charge refrigerant if necessary.
8.	No cooling or heating only indoor fan works.	Outdoor fan motor faulty or other fault caused, compressor overload protection cut out.	-Replace P.C.B. - Outdoor fan blocked remove obstructions.

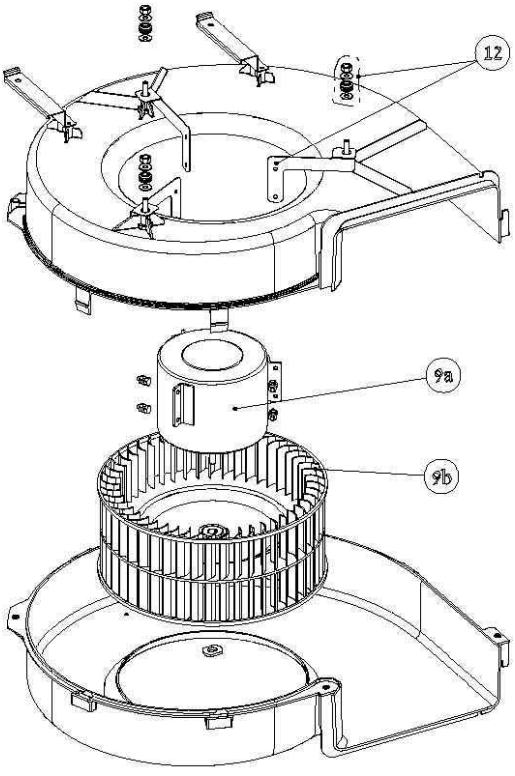
ATTENTION : check for broken or loose cable lugs first

NO	SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
9.	Only indoor fan and compressor working.	Outdoor fan blocked.	- Remove obstructions.
10.	Only indoor fan working.	-Run capacitor of outdoor fan motor faulty. -Windings of outdoor fan are shorted.	- Replace capacitor. -Replace motor.
11.	No cooling or heating takes place, indoor and outdoor fans working.	- Overload safety device on compressor is cut out (low voltage or high temperature) - Compressor run capacitor faulty. - Compressor windings are shorted.	- Check for proper voltage, switch off power and try again after one hour. - Replace compressor capacitor. - Replace compressor.
12.	No air supply at indoor unit, compressor operates.	-Indoor fan motor is blocked or turns slowly. -indoor fan run capacitor faulty. -motor windings are shorted.	- Check voltage, repair wiring if necessary. -Check fan wheel if it is tight enough on motor shaft, tighten if necessary. -Replace indoor fan motor.
13.	Partial, limited air supply at indoor unit.	Lack of refrigerant (will accompanied by whistling noise) cause ice formation on indoor unit coil in cooling mode.	-Charge the unit after localizing leak.
14.	Water accumulates and overflow from indoor unit section.	Drain tube or spout of drain pan clogged.	-Disassemble plastic drain tube from spout of indoor unit drain pan.
15.	Water dripping from outdoor unit base. (in heating mode)	Water drain outlet is clogged.	-Open outdoor unit cover clean out water outlet clean the base inside througly.
16.	Freeze-up of outdoor coil in heating mode, poor heating effect in room, indoor fan operates.	-Faulty outdoor thermistor. - Faulty control cable. - Outdoor temperature is too low (below -2°C) -Outdoor unit air outlet is blocked.	-Replace thermistor. - Repair control cable. - Shut unit off, outdoor temp. is below design conditions and cannot function properly. -Remove obstructions.

15. EXPLODED VIEWS AND SPARE PARTS LISTS

15.1 Indoor Unit: DLS 18, 24, 30, 37, 44





15.2 Indoor Unit: DLS 18

No.	Part No.	Description	Qty
1	473400	IU COIL GR/HDR DNG 18	1
2	473231	FLOAT SUPPORT DNG	1
3	473900	DNG METAL FILTER 18-30	1
4	473246	INSULATED DRAIN POOL ASSY DNG	1
5	473700	DNG OVER FLOW SWITCH	1
6	473244	COIL SUPPORT DNG 18-24	1
7	433432	P.C ASSY WITHOUT RELAY DNC	1
8	402713	WIRED DISPLAY BOX EMD/ELD	1
9	473907	FAN HOUSING ASSY DNG 18-24	1
11	473248	AIR FILTER FRAME ASSY DNG 18-30	1
12	473250	MOTOR LEG ASSY DNG	3
16	436673	REMOTE CONTROL RC4/RC	1
17	489117	RELAY AC, SPST, 30A	1
18	442019	CAPACITOR 8mF 400V P1/P2	1
19a	473720	THERMISTOR+CAP WITH CONNECTOR	1
19b	473710	THERMISTOR WITH CONNECTOR L235	1
7a	402730	CABLE 8 WIRES 7M WTH CONNECTOR	1
9a	473008	MOTOR DNG 18/24	1
9b	473300	CENTRIFUGAL FAN DNG 300/100	1

15.3 Indoor Unit: DLS 24

No.	Part No.	Description	Qty
1	473410	IU COIL GR/HDR DNG 24	1
2	473231	FLOAT SUPPORT DNG	1
3	473900	DNG METAL FILTER 18-30	1
4	473246	INSULATED DRAIN POOL ASSY DNG	1
5	473700	DNG OVER FLOW SWITCH	1
6	473244	COIL SUPPORT DNG 18-24	1
7	433432	P.C ASSY WITHOUT RELAY DNC	1
8	402713	WIRED DISPLAY BOX EMD/ELD	1
9	473907	FAN HOUSING ASSY DNG 18-24	1
11	473248	AIR FILTER FRAME ASSY DNG 18-30	1
12	473250	MOTOR LEG ASSY DNG	3
16	436673	REMOTE CONTROL RC4/RC	1
18	442019	CAPACITOR 8mF 400V P1/P2	1
19a	473720	THERMISTOR+CAP WITH CONNECTOR	1
19b	473710	THERMISTOR WITH CONNECTOR L235	1
7a	402730	CABLE 8 WIRES 7M WTH CONNECTOR	1
9a	473008	MOTOR DNG 18/24	1
9b	473300	CENTRIFUGAL FAN DNG 300/100	1

15.4 Indoor Unit: DLS 30

No.	Part No.	Description	Qty
1	473420	IU COIL GR/HDR DNG 30	1
2	473231	FLOAT SUPPORT DNG	1
3	473900	DNG METAL FILTER 18-30	1
4	473246	INSULATED DRAIN POOL ASSY DNG	1
5	473700	DNG OVER FLOW SWITCH	1
6	473210	COIL SUPPORT DNG 30	1
7	433432	P.C ASSY WITHOUT RELAY DNC	1
8	402713	WIRED DISPLAY BOX EMD/ELD	1
9	473905	FAN HOUSING ASSY DNG 30	1
11	473248	AIR FILTER FRAME ASSY DNG 18-30	1
12	473250	MOTOR LEG ASSY DNG	3
16	436673	REMOTE CONTROL RC4/RC	1
18	442019	CAPACITOR 8mF 400V P1/P2	1
19a	473720	THERMISTOR+CAP WITH CONNECTOR	1
19b	473710	THERMISTOR WITH CONNECTOR L235	1
7a	402730	CABLE 8 WIRES 7M WTH CONNECTOR	1
9a	473007	MOTOR DNG 30	1
9b	473300	CENTRIFUGAL FAN DNG 300/100	1

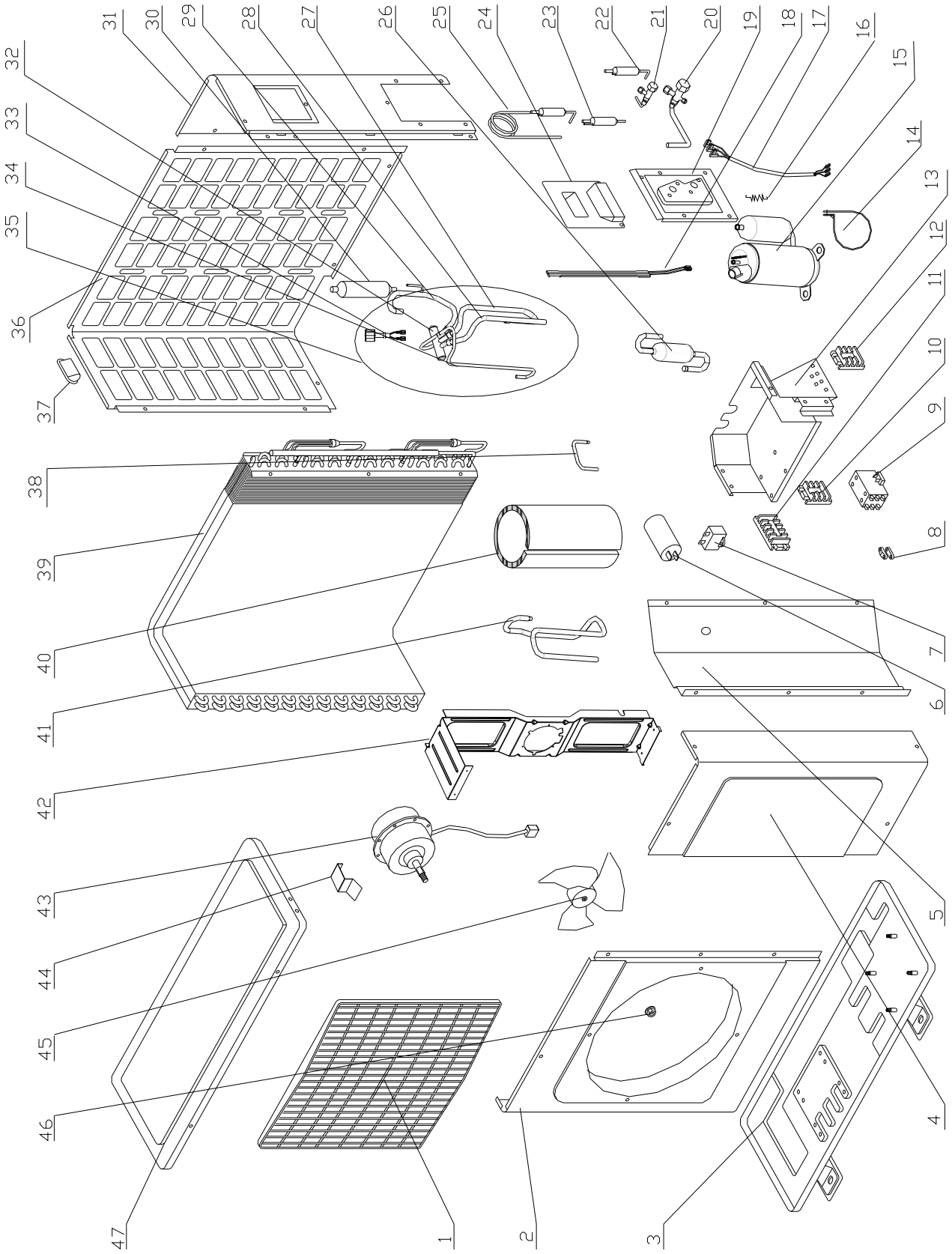
15.5 Indoor Unit: DLS 37

No.	Part No.	Description	Qty
1	473430	IU COIL GR/HDR DNG 37	1
2	473231	FLOAT SUPPORT DNG	1
3	473902	DNG METAL FILTER 37-44	1
4	473247	INSULATED DRAIN POOL ASSY DNG	1
5	473700	DNG OVER FLOW SWITCH	1
6	473245	COIL SUPPORT DNG 37	1
7	433432	P.C ASSY WITHOUT RELAY DNC	1
8	402713	WIRED DISPLAY BOX EMD/ELD	1
9	473906	FAN HOUSING ASSY DNG 37-44	1
11	473249	AIR FILTER FRAME ASSY DNG 37-44	1
12	473250	MOTOR LEG ASSY DNG	3
16	436673	REMOTE CONTROL RC4/RC	1
18	442019	CAPACITOR 8mF 400V P1/P2	1
19a	473720	THERMISTOR+CAP WITH CONNECTOR	1
19b	473710	THERMISTOR WITH CONNECTOR L235	1
7a	402730	CABLE 8 WIRES 7M WTH CONNECTOR	1
9a	473006	MOTOR DNG 37	1
9b	473301	CENTRIFUGAL FAN DNG 300/130	1

15.6 Indoor Unit: DLS 44

No.	Part No.	Description	Qty
1	473440	IU COIL GR/HDR DNG 44	1
2	473231	FLOAT SUPPORT DNG	1
3	473902	DNG METAL FILTER 37-44	1
4	473247	INSULATED DRAIN POOL ASSY DNG	1
5	473700	DNG OVER FLOW SWITCH	1
6	473211	COIL SUPPORT DNG 44	1
7	433432	P.C ASSY WITHOUT RELAY DNC	1
8	402713	WIRED DISPLAY BOX EMD/ELD	1
9	473906	FAN HOUSING ASSY DNG 37-44	1
11	473249	AIR FILTER FRAME ASSY DNG 37-44	1
12	473250	MOTOR LEG ASSY DNG	3
16	436673	REMOTE CONTROL RC4/RC	1
18	442019	CAPACITOR 8mF 400V P1/P2	1
19a	473720	THERMISTOR+CAP WITH CONNECTOR	1
19b	473710	THERMISTOR WITH CONNECTOR L235	1
7a	402730	CABLE 8 WIRES 7M WTH CONNECTOR	1
9a	473006	MOTOR DNG 37	1
9b	473301	CENTRIFUGAL FAN DNG 300/130	1

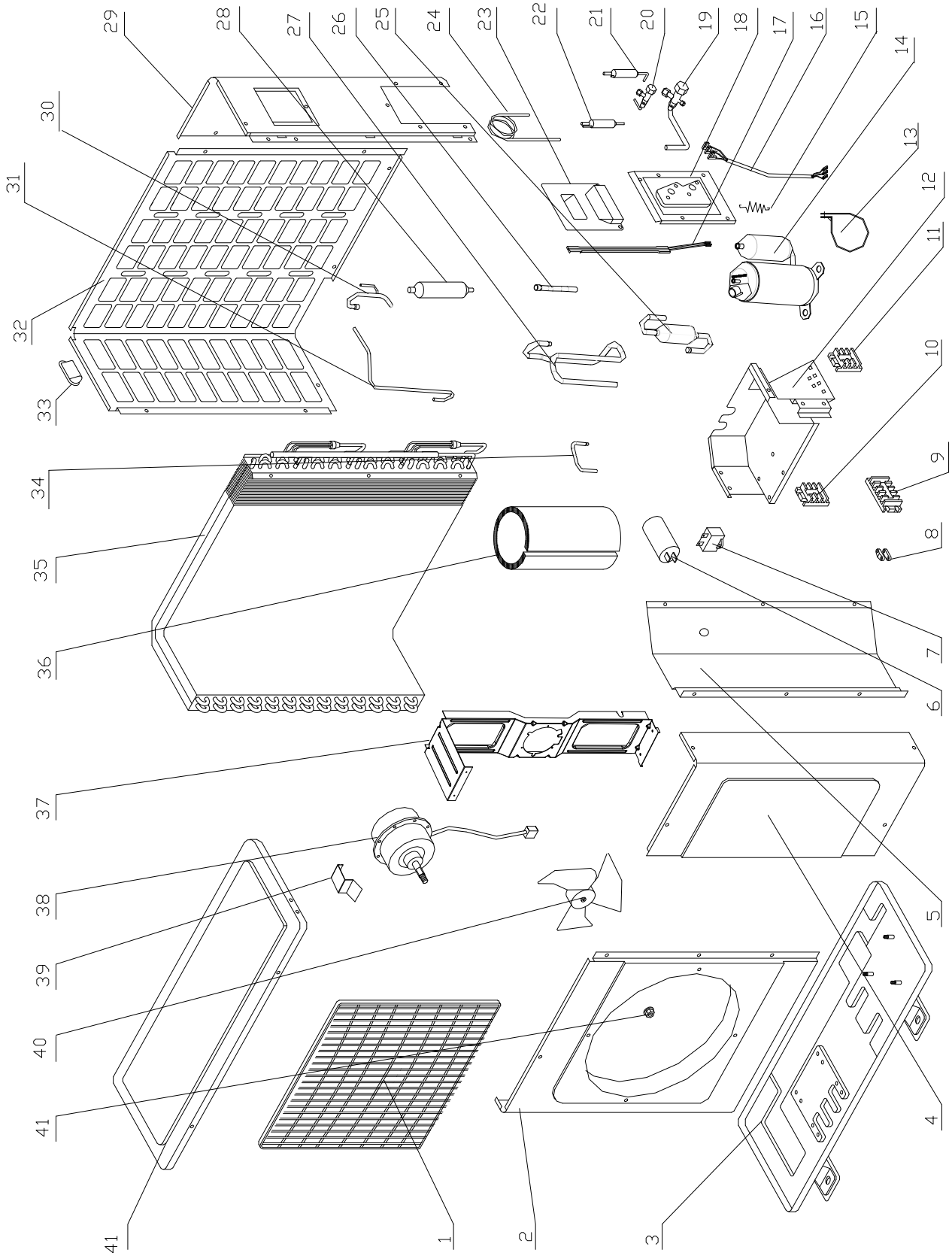
15.7 Outdoor Unit: GC 18 RC 1PH



15.8 Outdoor Unit: GC 18 RC 1PH

SP No.	Part No.	Description	Qty
1	4517144	COVER PP+UV	1
2	452795700	PAINTED LEFT CABINET ASSY	1
3	452989200	Base welding plate assy.	1
4	4516786	PAINTED RIGHT CABINET ASSY	1
5	4516985	Partition Plate	1
6	455000506	Compressor Capacitor With Screw 45uF (CBB65)	1
7	455000104	Double patch Capacitor for fan motor 4uF (CBB61S)	1
8	204107	Cable clip Nylon	2
9	4524907	contactor (CJX9B-25S/01)	1
10	4521744	3 Poles Terminal Block (4mm2)	1
11	4522469	4 LEVEL TERMINAL BLOCK	1
12	4521733	3 Poles Terminal Block (6mm2)	1
13	4521340	Controller Box	1
14	4525427	Clip for capacitance(d=50)	1
15	453089900	Compressor Assy.PA200X2CS-4KU1	1
16	4519000	Spring of compressor heater	1
17	4517345	COMPRESSOR WIRE ASSY. 2.5mm2	1
18	4526922	Heater for compressor	1
19	4516766	PAINTED VALVE PLATE ASSY	1
20	4526530	LOW PRESS VALVE (R410A)	1
21	4526531	High press valve(R410A)	1
22	4526931	filter welding assy. 2	1
23	4526839	filter welding assy.	1
24	4523145	R.lifter	1
25	4526840	Single-way welding assy.	1
26	4523338	Accumulator assy.	1
27	452976500	Suction pipe 2	1
28	452976600	Low pressure pipe	1
29	452976400	Condenser pipe assy.	1
30	4526291	Muffler	1
31	4525938	PAINTED RIGHT-BACK CABINET ASSY	1
32	4526522	FOUR-WAY VALVE ( ) R410A	1
33	4526589	4-Way Valve Coil FOR R410A	1
34	452976100	Discharge pipe 2	1
35	452987800	4-way welding assy. for GC18RC R410A PA200	1
36	4517028	PAINTED LEFT-BACK GRILL	1
37	4516758	SMALL HANDLE	1
38	452976000	Discharge pipe 1	1
39	452796500	Condenser-Distributing Soldering Assy.GC-18RC R410A	1
40	452988800	Insulation for compressor PA215/240	1
41	452976200	Suction pipe 1	1
42	4526509	MOTOR BRAKECT (new)	1
43	4526862	motor YYK85E-6B for GC18RC	1
44	4526585	connect for motor backet	1
45	4526510	FAN D=460mm (3 blade)	1
46	4523141	M10 Hexagon locked nut M10	1
47	4516788	PAINTED TOP COVER ASSY	1

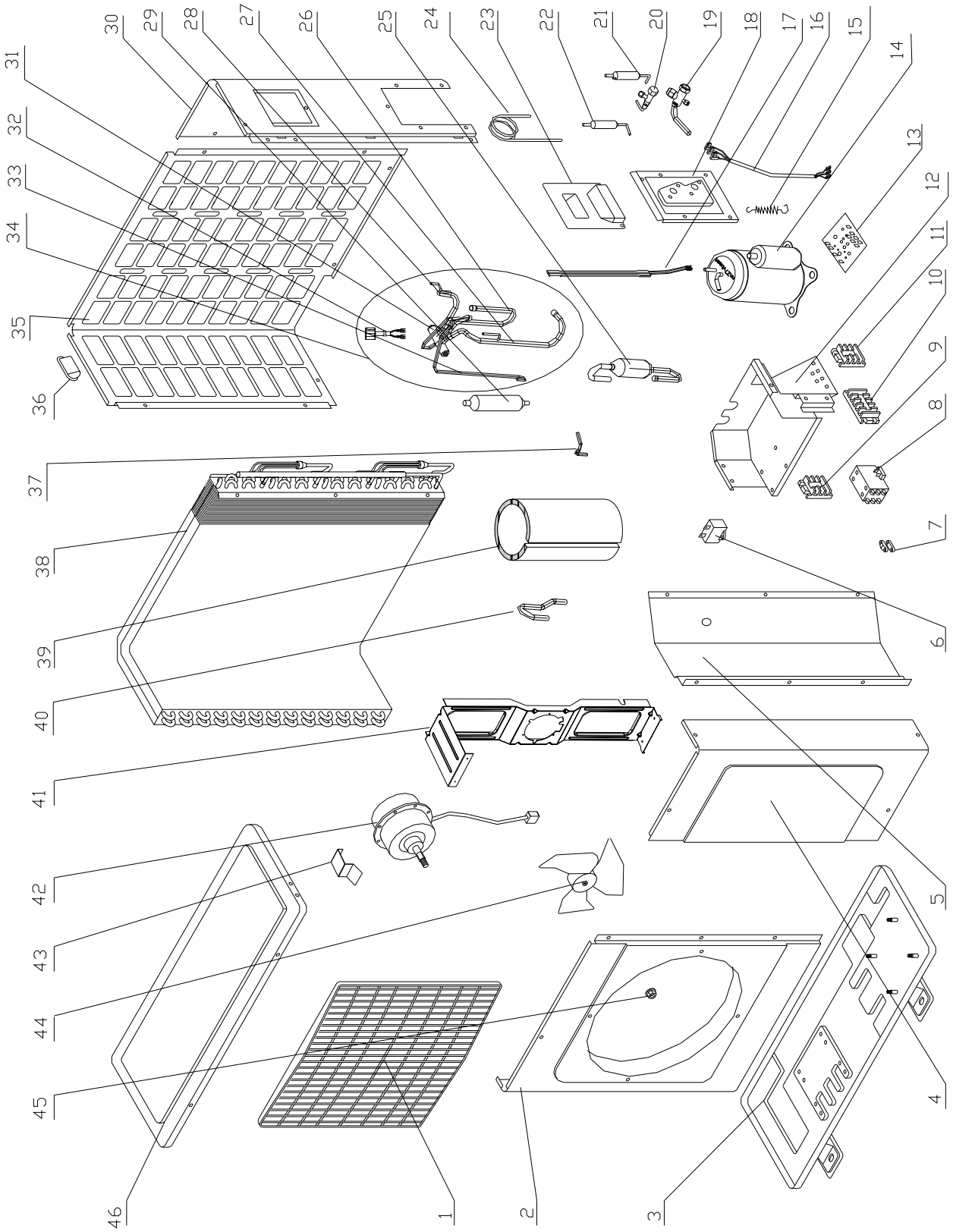
15.9 Outdoor Unit: GC 18 ST 1PH



15.10 Outdoor Unit: GC 18 ST 1PH

SP No.	Part No.	Description	Qty
1	4517144	FAN COVER PP+UV	1
2	452795700	PAINTED LEFT CABINET ASSY	1
3	452989200	Base welding plate assy.	1
4	4516786	PAINTED RIGHT CABINET ASSY	1
5	4516985	Partition Plate	1
6	455000506	Compressor Capacitor With Screw 45uF (CBB65)	1
7	455000104	Double patch Capacitor for fan motor 4uF (CBB61S)	1
8	204107	Cable clip Nylon	2
9	4521744	3 Poles Terminal Block (4mm2)	1
10	4522469	4 LEVEL TERMINAL BLOCK	1
11	4521733	3 Poles Terminal Block (6mm2)	1
12	4521340	Controller Box	1
13	4525427	Clip for capacitance(d=50)	1
14	453089900	Compressor Assy.PA200X2CS-4KU1	1
15	4519000	Spring of compressor heater	1
16	4517345	COMPRESSOR WIRE ASSY. 2.5mm2	1
17	4526922	heater for compressor	1
18	4516766	PAINTED VALVE PLATE ASSY	1
19	4526530	LOW PRESS VALVE (R410A)	1
20	4526531	High press valve(R410A)	1
21	4526931	filter welding assy. 2	1
22	4526839	filter welding assy.	1
23	4523145	R.lifter	1
24	452821900	Capillary assy. for cooling	1
25	4523338	Accumulator assy.	1
26	452977200	Low pressure pipe	1
27	452976200	Suction pipe 1	1
28	4526291	Muffler	1
29	4525938	PAINTED RIGHT-BACK CABINET ASSY	1
30	452977000	Condenser pipe assy.	1
31	452976800	Discharge pipe 2	1
32	4517028	PAINTED LEFT-BACK GRILL	1
33	4516758	SMALL HANDLE	1
34	452976000	Discharge pipe 1	1
35	452821300	Condenser-Distributing Soldering Assy.GC-18ST R410A	1
36	452988800	Insulation for compressor PA215/240	1
37	4526509	MOTOR BRAKECT (new)	1
38	4526864	motor YYK85E-6	1
39	4526585	connect for motor backet	1
40	4526510	FAN D=460mm (3 blade)	1
41	4523141	Hexagon locked nut M10	1
42	4516788	PAINTED TOP COVER ASSY	1

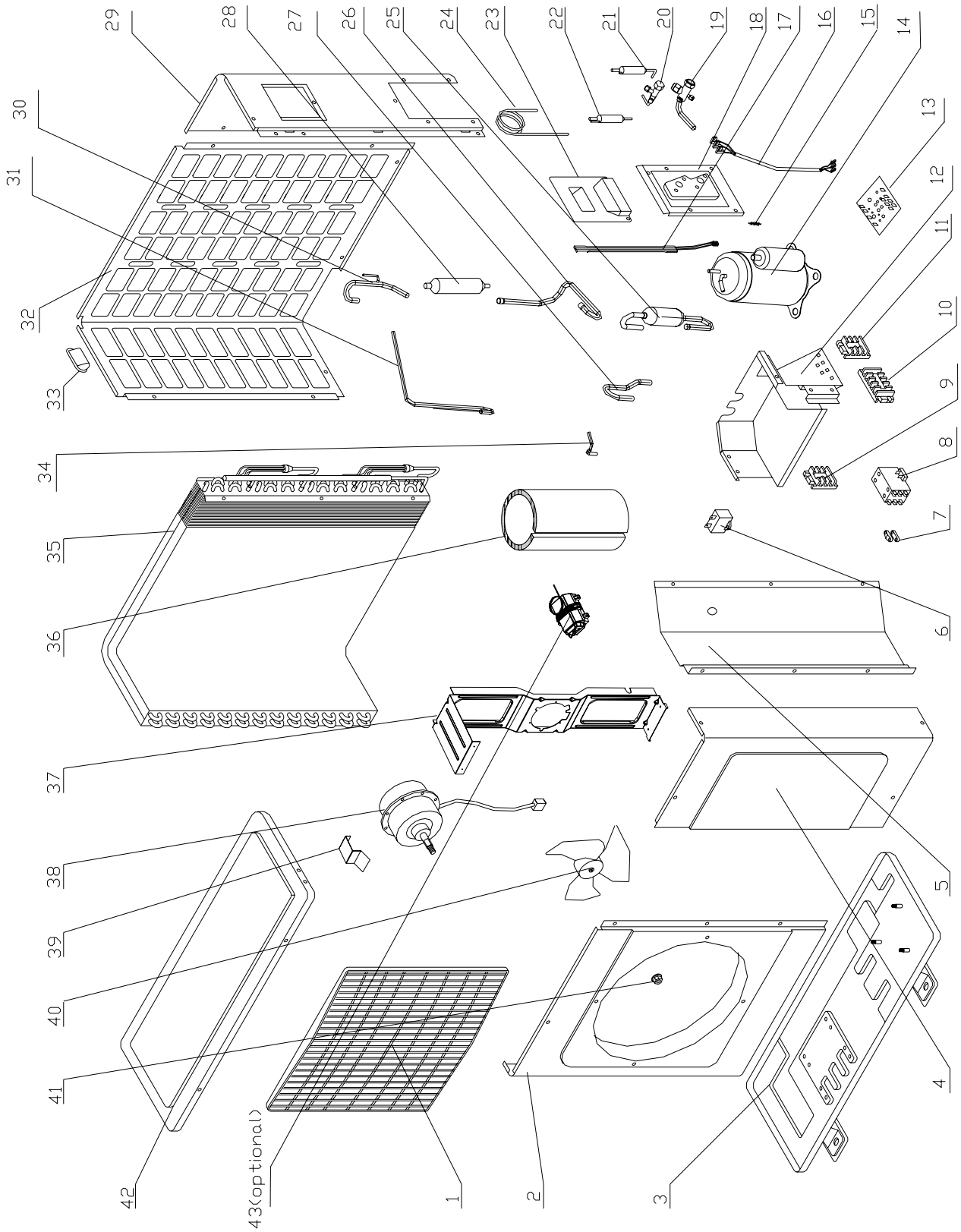
15.11 Outdoor Unit: GC 18 RC 3PH



15.12 Outdoor Unit: GC 18 RC 3PH

SP No.	Part No.	Description	Qty
1	4517144	Grid A	1
2	452795700	left-cover	1
3	452881901	base panel	1
4	4516786	right cover	1
5	4516985	partition	1
6	455000104	capacitance for fan	1
7	204107	cable clip	1
8	452872000	cantactor	2
9	4522469	4 bit terminal	1
10	4521289	6 bit terminal	1
11	4521695	5 bit terminal	1
12	453136700	electrical box	1
13	4519695	mix and missing phase device	1
14	453019600	compressor NN21YDAMT	1
15	4519000	Spring fo compressor heater	1
16	4517131	cable for compressor	1
17	4520870	heater	1
18	4516766	valve -panel	1
19	453163700	low pressure valve	1
20	4526531	high pressure valve	1
21	4526839	filter assy	1
22	4526931	filter assy	1
23	4523145	big handle	1
24	4526840	sing-way welding assy	1
25	452891400	accumulation	1
26	452883700	suction tube	1
27	452883800	low pressure tube	1
28	453160700	condenser tube	1
29	4526291	muffler	1
30	4525938	right-back cover	1
31	4526522	4-way valve	1
32	4526589	coil for 4-way valve	1
33	452890700	discharge tube	1
34	453251600	4-way welding assy	1
35	4517028	left-back grid	1
36	4516758	small handle	1
37	453172900	discharge tube	1
38	452796500	condenser welding assy	1
39	452891300	insulation for compressor	1
40	452883600	suction tube	1
41	4526509	support for motor	1
42	4526864	motor	1
43	452907400	connect panel	1
44	4526510	fan	1
45	4523141	nut	1
46	4516788	top cover	1

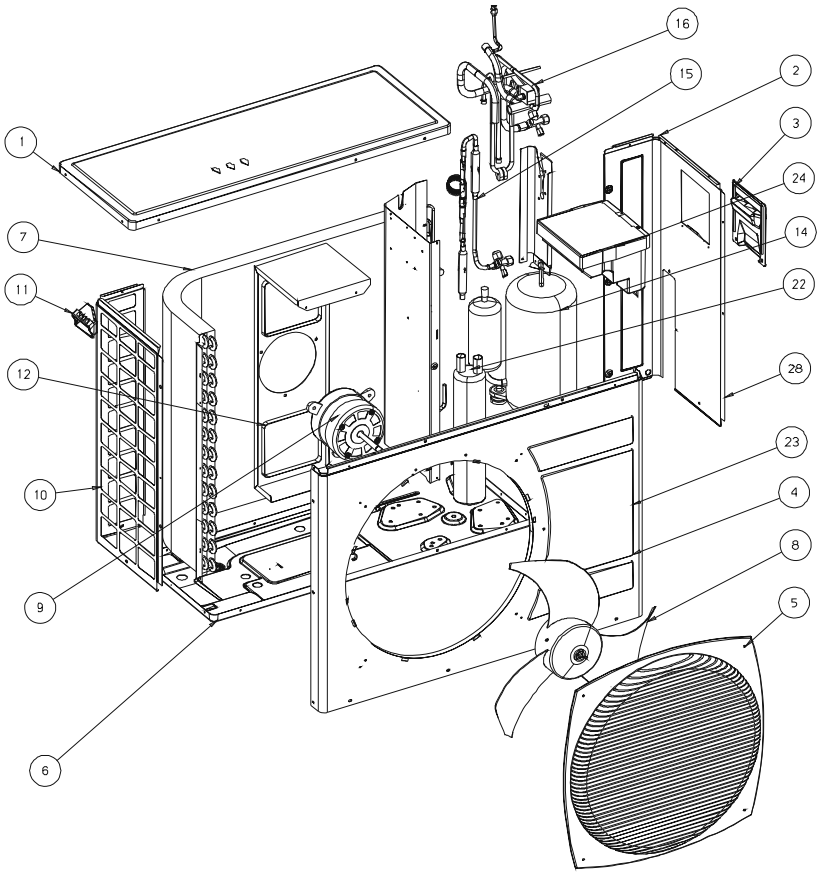
15.13 Outdoor Unit: GC 18 ST 3PH

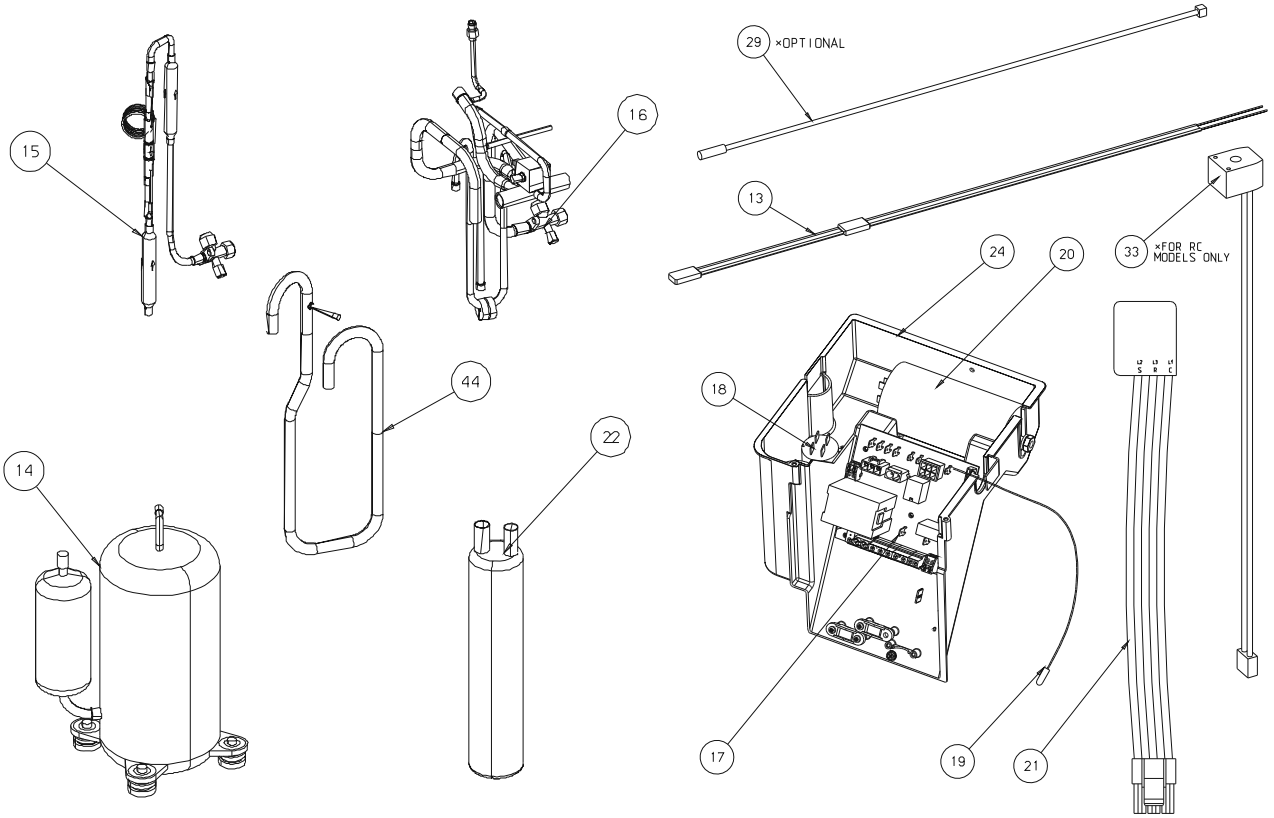


15.14 Outdoor Unit: GC 18 ST 3PH

SP No.	Part No.	Description	Qty
1	4517144	Fan cover	1
2	452795700	Painted left cabinet assy	1
3	452881901	Base plate paint assy.	1
4	4516786	Painted right cabinet assy	1
5	4516985	Partition plate	1
6	455000104	capacitance for fan	1
7	204107	cable clip	1
8	452872000	cantactor	2
9	4522469	4 bit terminal	1
10	4521289	6 bit terminal	1
11	4521695	5 bit terminal	1
12	453136700	electrical box	1
13	4519695	mix and missing phase device	1
14	453019600	Compressor assy	1
15	4519000	Spring for compressor heater	1
16	4517131	Compressor wire assy	1
17	4520870	Heater for compressor	1
18	4516766	Painted valve plate assy	1
19	453163700	Low pressure valve(R410A)	1
20	4526531	High pressure valve(R410A)	1
21	4526839	Filter assy 1	1
22	4526931	Filter assy 2	1
23	4523145	R.lifter	1
24	452821900	Capillary welding assy.	1
25	452891400	Accumulation assy	1
26	452893600	Suction pipe	1
27	452883600	Suction pipe assy. 2	1
28	4526291	Muffler	1
29	4525938	Painted right-back cabined assy	1
30	453160800	condenser pipe assy.	1
31	453160600	Discharge pipe 1	1
32	4517028	Painted left-back grill	1
33	4516758	Small handle	1
34	453160500	Discharge pipe 2	1
35	452821300	Condenser and distributor welding assy.	1
36	452891300	Insulation for compressor	1
37	4526509	Moter brakect (new)	1
38	4526864	motor YYK85E-6	1
39	452907400	Hook for condenser	1
40	4526510	FAN D=460mm (3 blade)	1
41	4523141	M10 Hexagon locked nut M10	1
42	4516788	Painted top cover assy	1

15.15 Outdoor Unit: GCN 24 RC 1PH

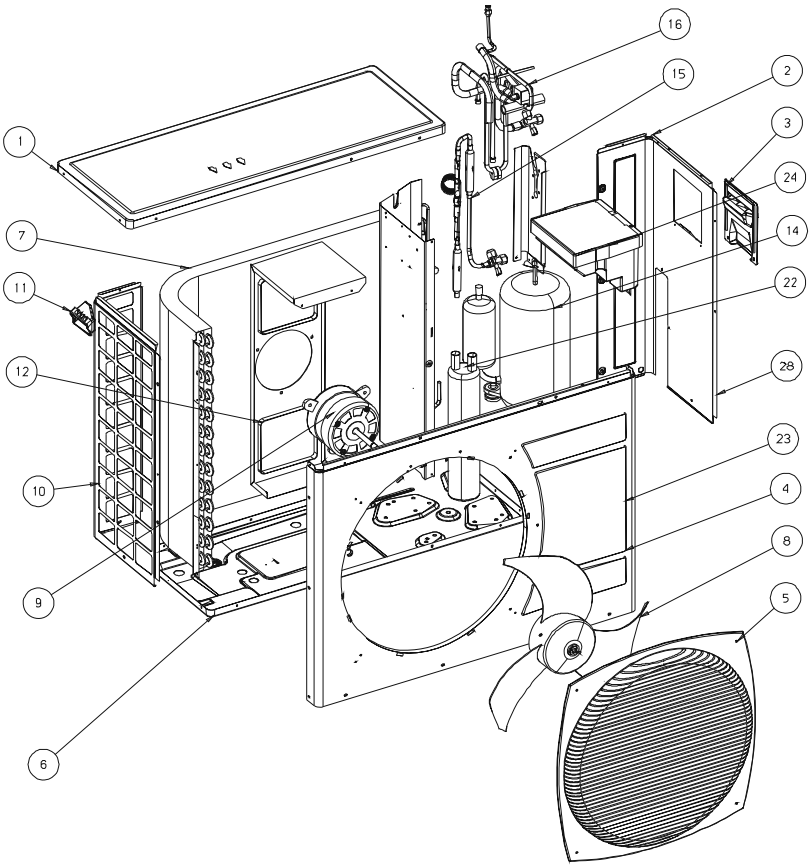


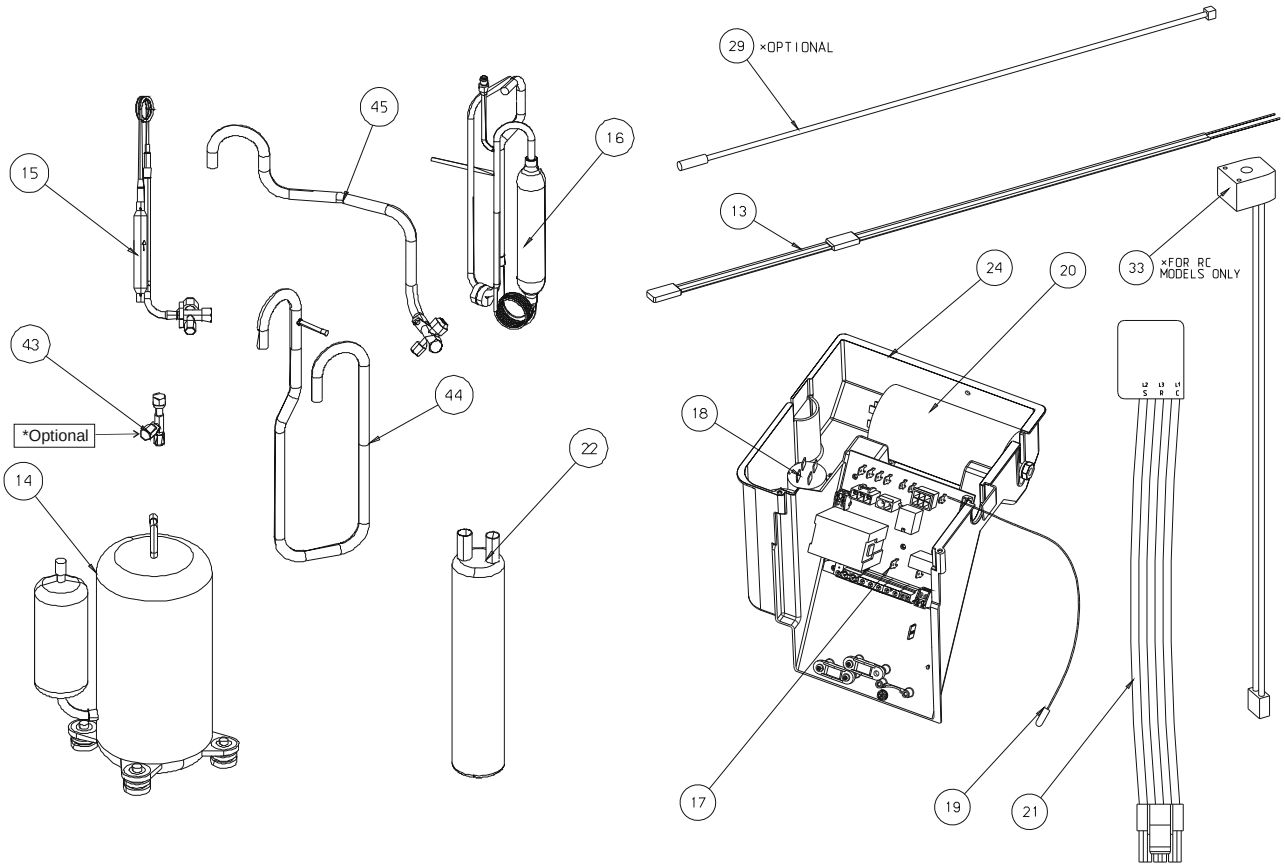


15.16 Outdoor Unit: GCN 24 RC 1PH

No.	SP No.	Part No.	Description	Qty
1	13	190443	HEATER CRANKCASE MITSUBISHI CO	1
2	22	402283	SUCTION ACCUMULATOR 3"x5/8" 3.	1
3	17	402495	BOARD TPHN 5B	1
4	7	433285	COIL OU7-24 HDR	1
5	15	433288	CAPILLARY ASSY OU7-24 R410A	1
6	16	433291	TUBING ASSY OU7 R410A	1
7	14	433293	COMPRESSOR NN27VBAMT	1
8	6	433294	NEW BASE ASSY OU 2005 EXPORT	1
9	44	433816	SUCTION ASSY OU7 R410A	1
10	9	434062	MOTOR 86W,2S,OU7-24	1
11	19	434716	THERMISTOR+CAP WTH CONNECTOR L	1
12	3	436357	SMALL ELECTRICAL COVER OU	1
13	11	436358	OU LEADING HANDLE	1
14	1	437045	UPPER COVER EL13 OU LARGE	1
15	5	437091	OU SQUARE FAN GUARD	1
16	24	437229	ELECTRICAL BOX TPHN	1
17	21	437274	COMPRESOR WIRING OU7/8-1PH MIT	1
18	4	439329	FRONT COVER/COLLECTOR OU7-35/9	1
19	12	439342	MOTOR SUPPORT OU7	1
20	18	442007	CAPACITOR 6mF 400V P1/P2	1
21	20	442016	CAPACITOR 55mF 400V P1/P2	1
22	33	442466	VALVE COIL L700 MOLEX-SANHUA	1
23	8	4529604	AXIAL FAN D493*143	1

15.17 Outdoor Unit: GCN 24 ST 1PH

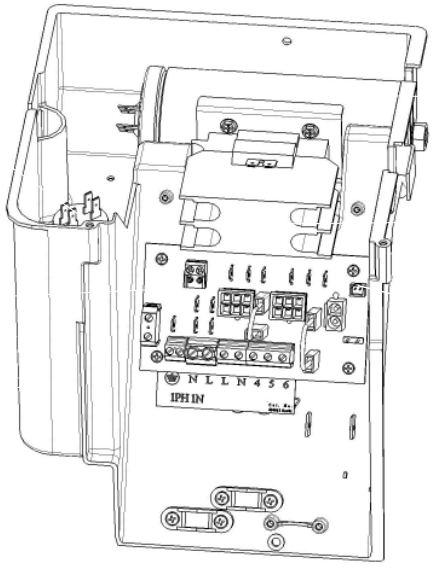




15.18 Outdoor Unit: GCN 24 ST 1PH

No.	SP No.	Part No.	Description	Qty
1	13	190443	HEATER CRANKCASE MITSUBISHI CO	1
2	22	402283	SUCTION ACCUMULATOR 3"x5/8" 3.	1
3	17	402495	BOARD TPHN 5B	1
4	14	433293	COMPRESSOR NN27VBAMT	1
5	6	433705	NEW BASE ASSY OU 2005 LOCAL	1
6	44	433816	SUCTION ASSY OU7 R410A	1
7	16	433817	TUBING ASSY OU7 ST R410A	1
8	15	433845	CAPILLARY ASSY OU7-24 ST R410A	1
9	7	433846	COIL OU7-24 ST	1
10	45	433847	GAS VAVE ASSY OU7 ST R410A	1
11	9	434062	MOTOR 86W,2S,OU7-24	1
12	19	434716	THERMISTOR+CAP WTH CONNECTOR L	1
13	3	436357	SMALL ELECTRICAL COVER OU	1
14	11	436358	OU LEADING HANDLE	1
15	1	437045	UPPER COVER EL13 OU LARGE	1
16	5	437091	OU SQUARE FAN GUARD	1
17	24	437229	ELECTRICAL BOX TPHN	1
18	21	437274	COMPRESOR WIRING OU7/8-1PH MIT	1
19	4	439329	FRONT COVER/COLLECTOR OU7-35/9	1
20	12	439342	MOTOR SUPPORT OU7	1
21	18	442007	CAPACITOR 6mF 400V P1/P2	1
22	20	442016	CAPACITOR 55mF 400V P1/P2	1
23	8	4529604	AXIAL FAN D493*143	1

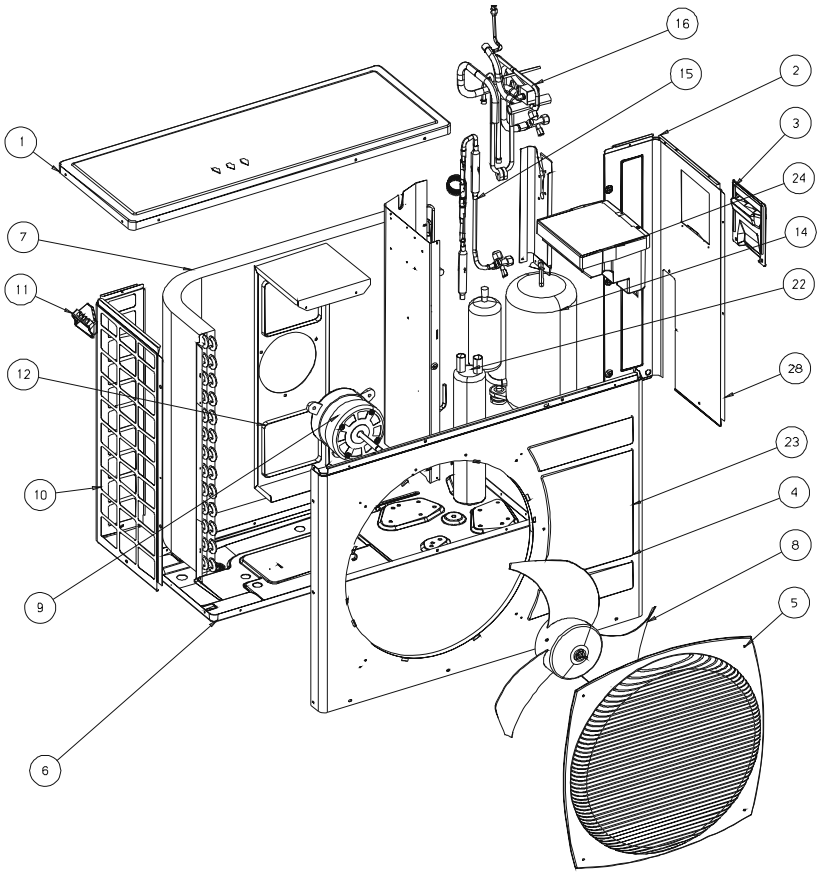
15.19 Outdoor Unit: GCN 24Z RC 1PH

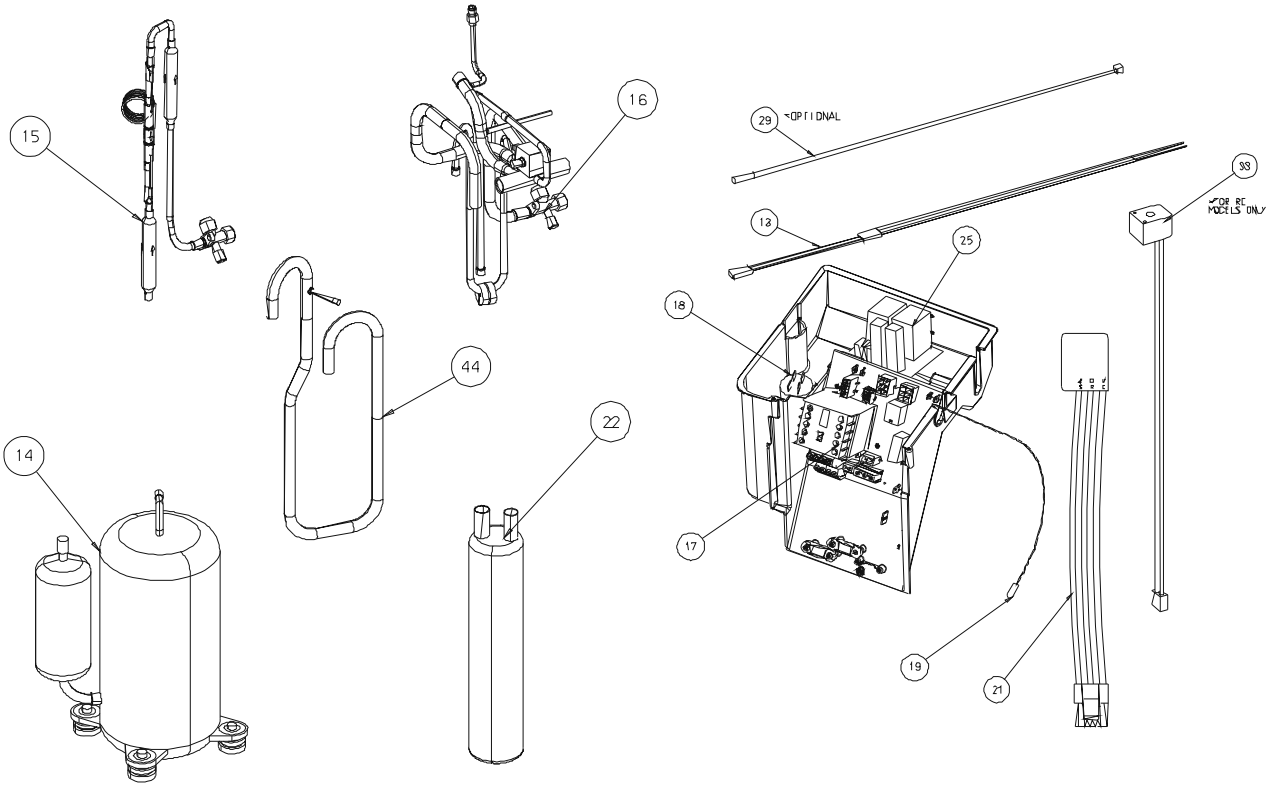


15.20 Outdoor Unit: GCN 24Z RC 1PH

SP No.	Part No.	Description	Qty
44	192207	CONTACTOR 230V, 40A	1
17	413496	BOARD TPHN 5F (RoHS)	1
2	433280	SIDE PANEL GCN 24 R410A	1
10	433281	SIDE GUARD GCN 24 R410	1
7	433285	COIL GCN 24 HDR	1
16	433660	TUBING ASSY GCN 24C R410A	1
6	433722	BASE ASSY GCN 24C EXPORT R410A	1
15	433934	CAPILLARY HEATING ASSY GCN 24 R410A	1
9	434211	replace by SP000000266 MOTOR+BRACKET	1
19a	434716	THERMISTOR L1050 (for coil)	1
3	436357	SMALL ELECTRICAL COVER CUE	1
11	436358	TRANSPORT HANDLE CUE	1
1	437045	LARGE UPPER COVER CUE	1
5	437091	OU SQUARE FAN GUARD	1
24	437229	ELECTRICAL BOX TPHN	1
21	438627	COMPRESSOR WIRING TPHN-5F	1
14	438795	COMPRESSOR GP270PAA	1
4	439329	COVERAIR COLLECTOR	1
12	439342	MOTOR BASE OU7	1
18	442007	CAPACITOR 6uF 400V	1
20	442038	CAPACITOR 50mF 400V P1/P2	1
33	442520	VALVE COIL L700 MOLEX-DUNAN	1
8	4529604	AXIAL FAN D493x143	1

15.21 Outdoor Unit: GCN 24 RC 3PH

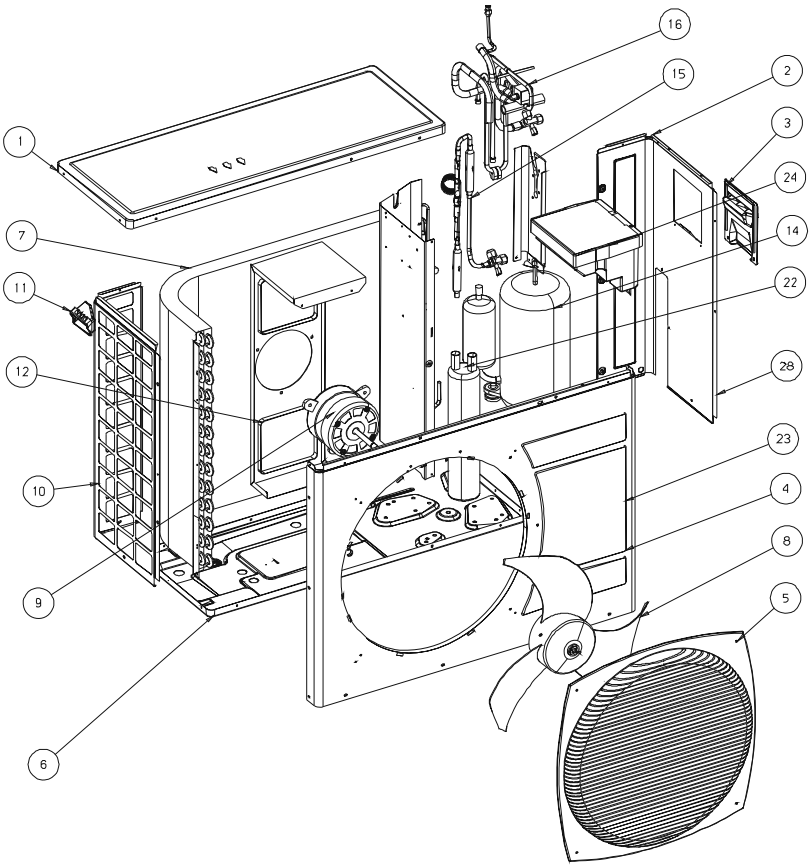


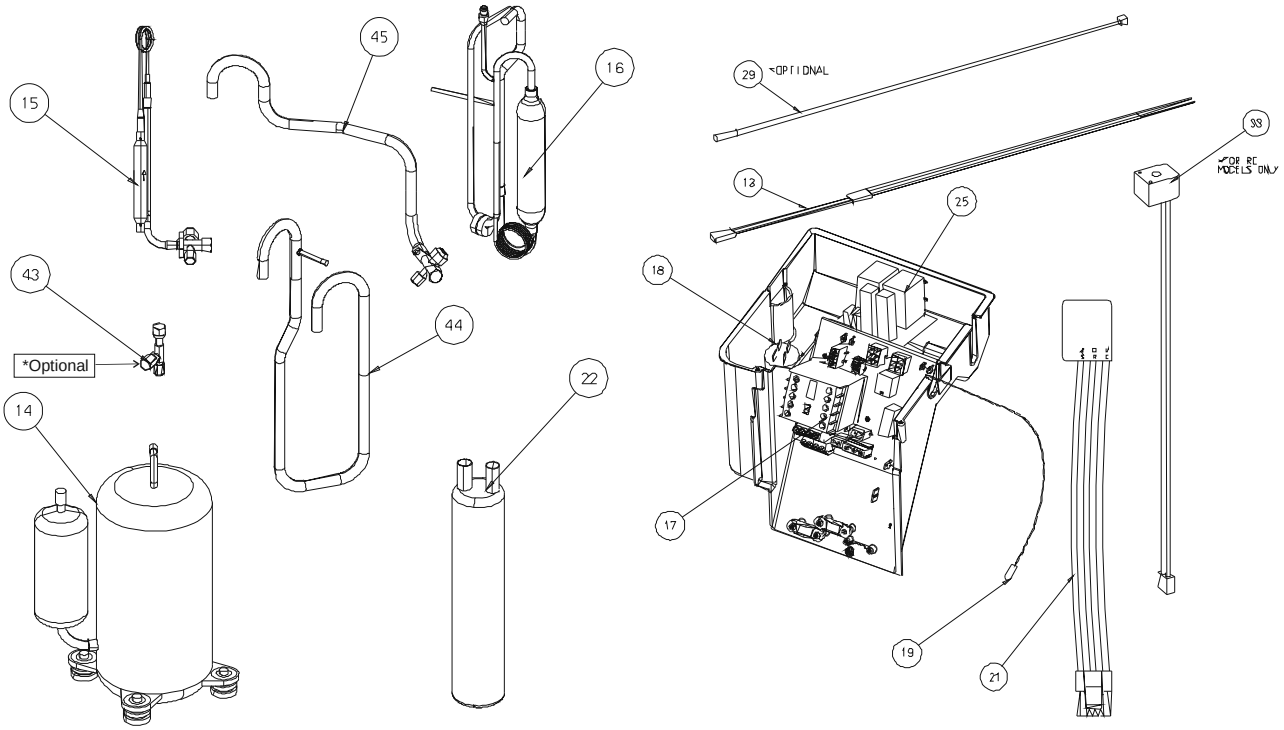


15.20 Outdoor Unit: GCN 24 RC 3PH

No.	SP No.	Part No.	Description	Qty
1	13	190443	HEATER CRANKCASE MITSUBISHI CO	1
2	22	402283	SUCTION ACCUMULATOR 3"x5/8" 3.	1
3	17	402494	BOARD TPHN 3C	1
4	7	433285	COIL OU7-24 HDR	1
5	15	433288	CAPILLARY ASSY OU7-24 R410A	1
6	16	433291	TUBING ASSY OU7 R410A	1
7	6	433294	NEW BASE ASSY OU 2005 EXPORT	1
8	14	433753	COMPRESSOR NN27YDAMT	1
9	44	433816	SUCTION ASSY OU7 R410A	1
10	9	434062	MOTOR 86W,2S,OU7-24	1
11	19	434716	THERMISTOR+CAP WTH CONNECTOR L	1
12	3	436357	SMALL ELECTRICAL COVER OU	1
13	11	436358	OU LEADING HANDLE	1
14	1	437045	UPPER COVER EL13 OU LARGE	1
15	5	437091	OU SQUARE FAN GUARD	1
16	24	437229	ELECTRICAL BOX TPHN	1
17	21	437278	COMPRESSOR WIRING OU7/8-3PH MI	1
18	4	439329	FRONT COVER/COLLECTOR OU7-35/9	1
19	12	439342	MOTOR SUPPORT OU7	1
20	25	439795	3PH MOTOR PROTECTOR	1
21	18	442007	CAPACITOR 6mF 400V P1/P2	1
22	33	442466	VALVE COIL L700 MOLEX-SANHUA	1
23	8	4529604	AXIAL FAN D493*143	1

15.21 Outdoor Unit: GCN 24 ST 3PH

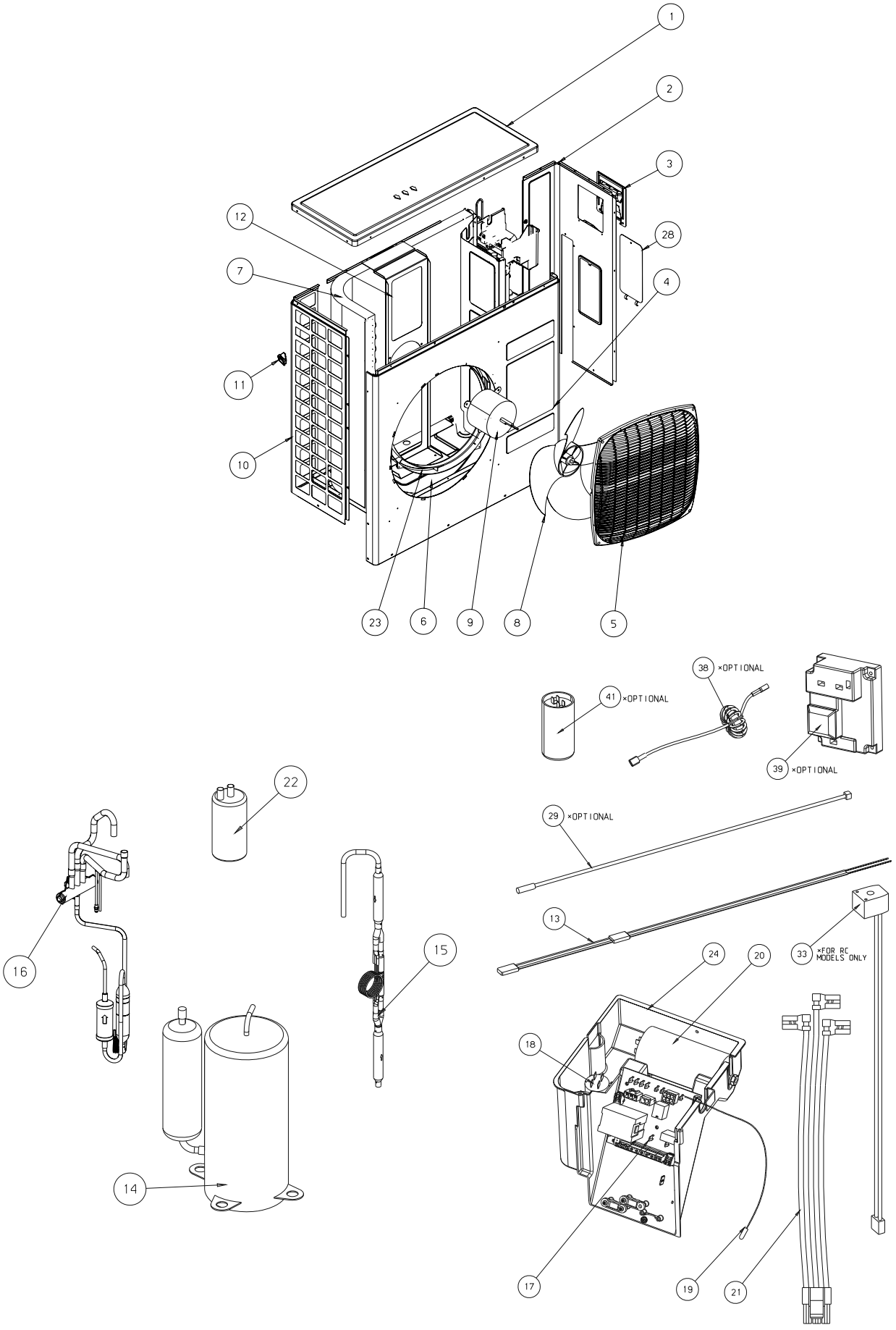




15.22 Outdoor Unit: GCN 24 ST 3PH

No.	SP No.	Part No.	Description	Qty
1	1	437045	LARGE UPPER COVER CUE	1
2	2	433280	SIDE PANEL OU7-24 R410A	1
3	3	436357	SMALL ELECTRICAL COVER CUE	1
4	4	439329	COVERAIR COLLECTOR	1
5	5	437091	OU SQUARE FAN GUARD	1
6	6	433705	NEW BASE ASSY OU 2005 LOCAL R410	1
7	7	433846	COIL OU7-24 ST	1
8	8	4529604	AXIAL FAN D493*143	1
9	9	434062	MOTOR 86W,2S,OU7-24	1
10	10	433281	SIDE GUARD OU7-24 R410	1
11	11	436358	TRANSPORT HANDLE CUE	1
12	12	439342	MOTOR BASE OU7	1
13	13	190443	HEATER CRANKCASE MITSUBISHI COMP	1
14	14	433753	COMPRESSOR NN27YDAMT	1
15	15	433845	CAPILLARY ASSY OU7-24 ST R410A	1
16	16	433817	TUBING ASSY OU7 ST R410A	1
17	17	402494	BOARD TPHN 3C	1
18	18	442007	CAPACITOR 6mF 400V P2	1
19	19	434716	THERMISTOR L1050 (for coil)	1
20	21	437278	MITSUBISHI	1
21	22	402283	R410A	1
22	24	437229	ELECTRICAL BOX TPHN	1
23	25	439795	BOARD 3PH PROTECTOR	1
24	44	433816	SUCTION ASSY OU7 R410A	1
25	45	433847	GAS VAVE ASSY OU7 ST R410A	1

15.23 Outdoor Unit: GCN 30 RC 1PH



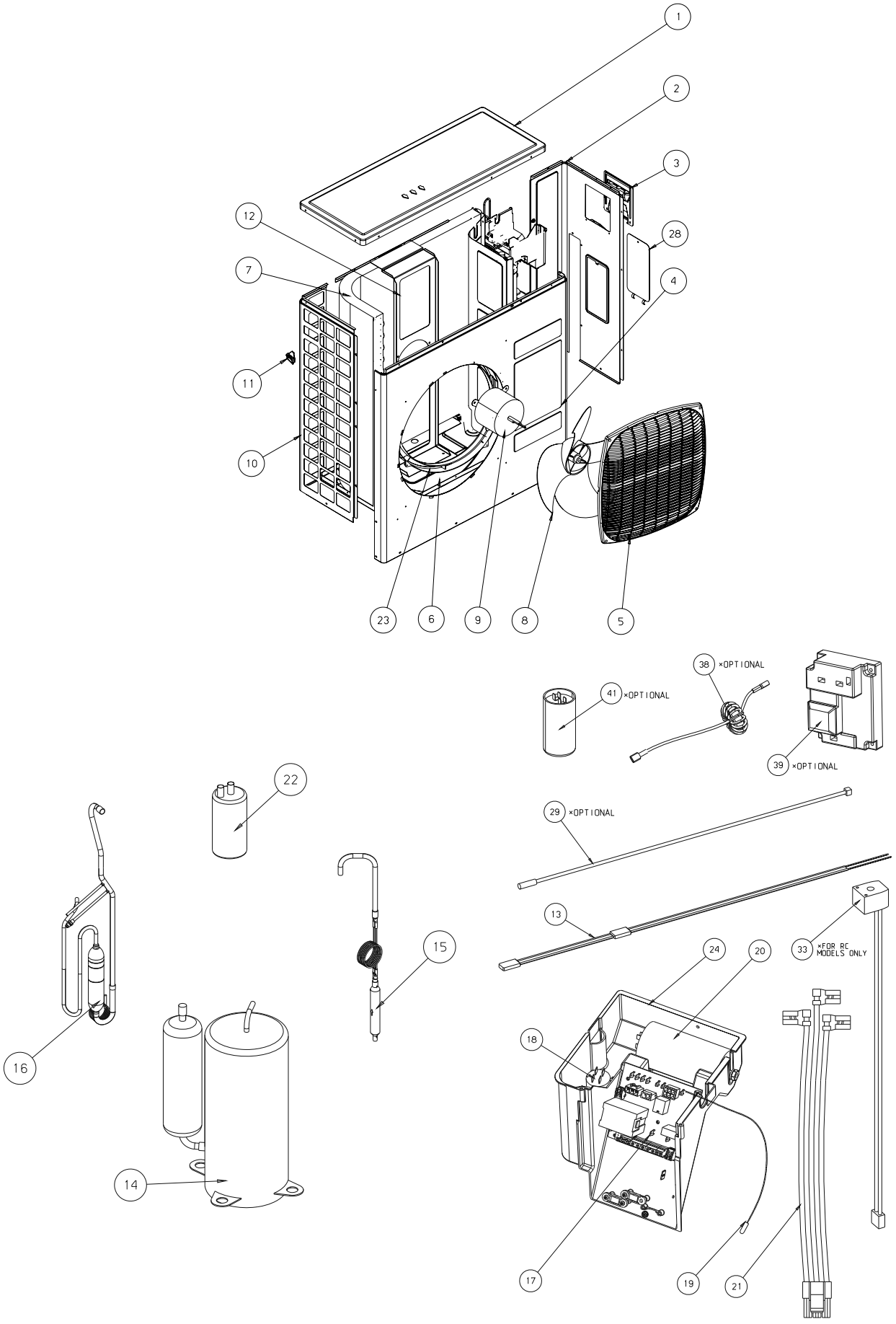
15.24 Outdoor Unit: GCN 30 RC 1PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433294	NEW BASE ASSY OU 2005 EXPORT	1	6
433807	COIL OU8-30 GR HDR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433297	COMPRESSOR NN33VAAMT	1	14
433822	CAPILLARY ASSY OU8-30 R410A RC	1	15
433967	TUBING ASSY OU8-30 R410A	1	16
402495	BOARD TPHN 5B	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442016	CAPACITOR 55mF 400V P1/P2	1	20
437274	COMPRESOR WIRING OU7/8-1PH	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439928	OUTLET PLASTIC RING OU8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33

15.25 Outdoor Unit: GCN 30 RC 1PH Soft Starter

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433294	NEW BASE ASSY OU 2005 EXPORT	1	6
433807	COIL OU8-30 GR HDR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433297	COMPRESSOR NN33VAAMT	1	14
433822	CAPILLARY ASSY OU8-30 R410A RC	1	15
433829	TUBING ASSY OU8-30 R410A	1	16
402495	BOARD TPHN 5B	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442016	CAPACITOR 55mF 400V P1/P2	1	20
437292	COMPRESSOR WIRING OU7/8-1PH	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439928	OUTLET PLASTIC RING OU8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33
433607	CHOCK FOR SOFT STARTER	1	38
433296	SOFT STARTER	1	39
442022	SOFT STARTER CAPACITOR 161-193	1	41

15.26 Outdoor Unit: GCN 30 ST 1PH



CONTENTS

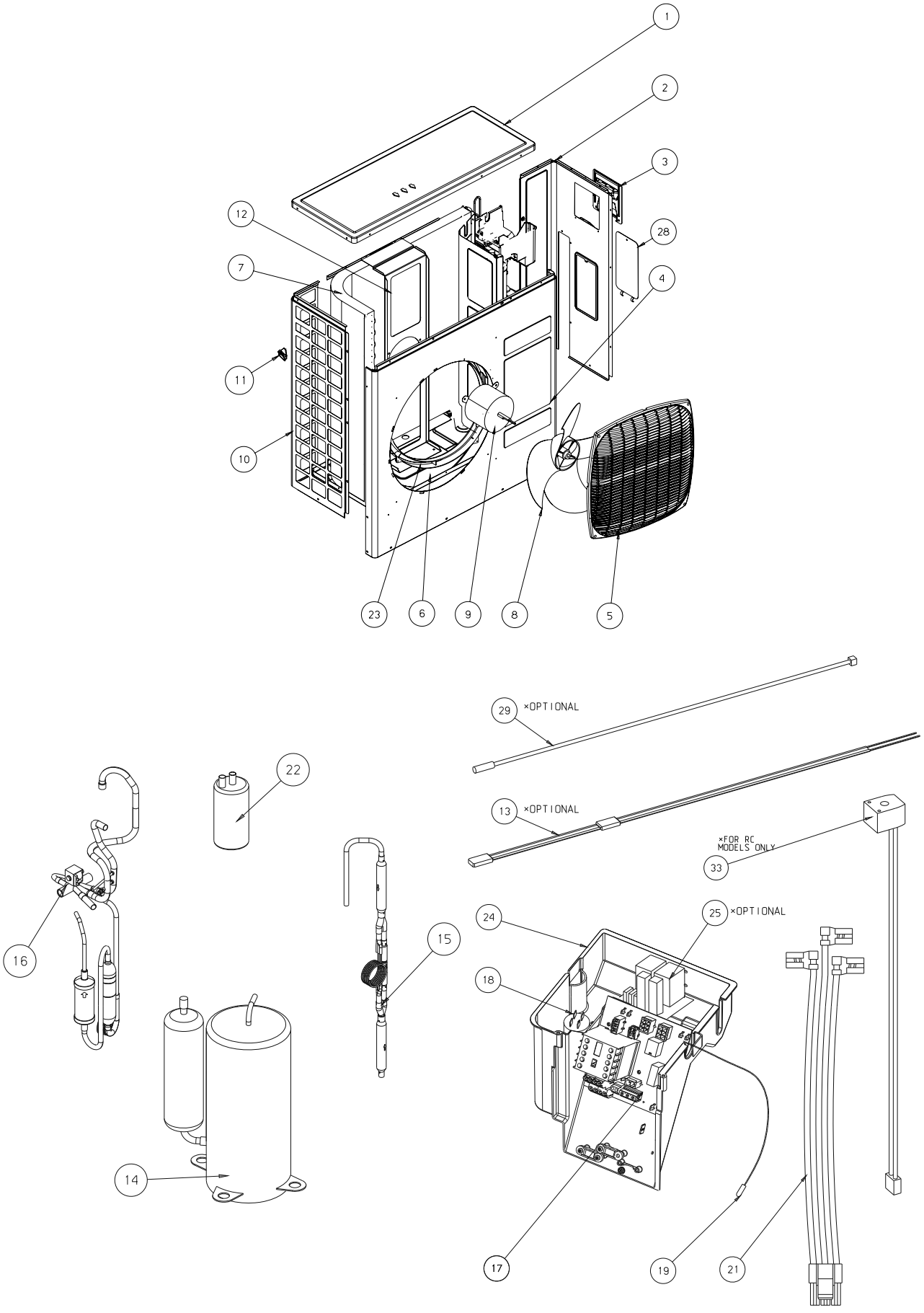
15.27 Outdoor Unit: GCN 30 ST 1PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433705	NEW BASE ASSY OU 2005 LOCAL	1	6
433834	COIL OU8-30 ST GR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433297	COMPRESSOR NN33VAAMT	1	14
433830	CAPILLARY ASSY OU8-30 R410A ST	1	15
433833	TUBING ASSY OU8-30 ST R410A	1	16
402495	BOARD TPHN 5B	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442016	CAPACITOR 55mF 400V P1/P2	1	20
437274	COMPRESOR WIRING OU7/8-1PH	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439928	OUTLET PLASTIC RING OU8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439656	SIDE COVER OU-8/10	1	28

15.28 Outdoor Unit: GCN 30 ST 1PH Soft Starter

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433705	NEW BASE ASSY OU 2005 LOCAL	1	6
433834	COIL OU8-30 ST GR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433297	COMPRESSOR NN33VAAMT	1	14
433830	CAPILLARY ASSY OU8-30 R410A ST	1	15
433833	TUBING ASSY OU8-30 ST R410A	1	16
402495	BOARD TPHN 5B	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442016	CAPACITOR 55mF 400V P1/P2	1	20
437292	COMPRESSOR WIRING OU7/8-1PH	1	21
402284	SUCTION ACCUMULATOR 5"x3/4"	1	22
439928	OUTLET PLASTIC RING OU 8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439656	SIDE COVER OU-8/10	1	28
433607	CHOCK FOR SOFT STARTER	1	38
433296	SOFT STARTER	1	39
442022	SOFT STARTER CAPACITOR 161-193	1	41

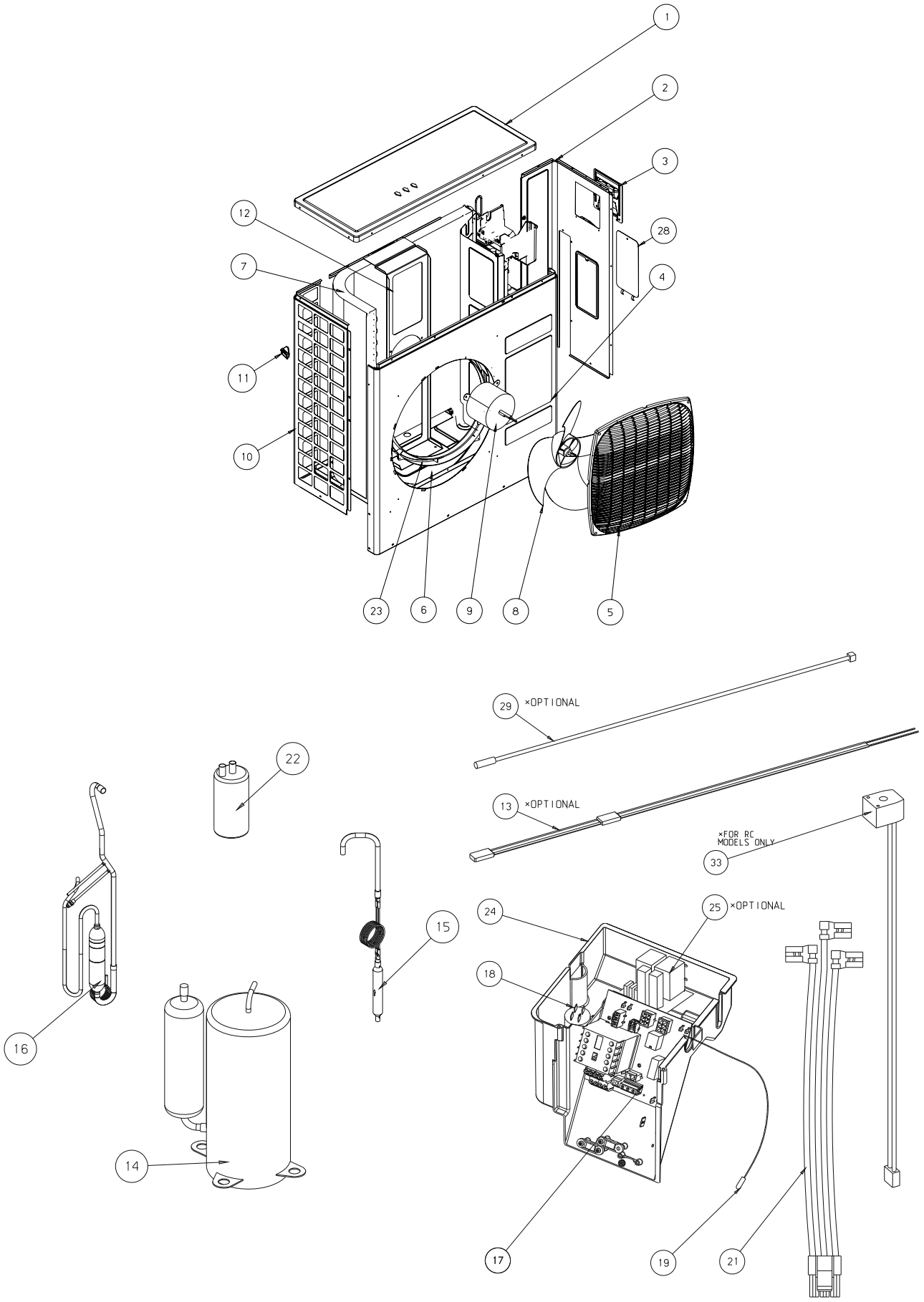
15.29 Outdoor Unit: GCN 30 RC 3PH



15.30 Outdoor Unit: GCN 30 RC 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433294	NEW BASE ASSY OU 2005 EXPORT	1	6
433807	COIL OU8-30 GR HDR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433298	COMPRESSOR NN33YCAMT	1	14
433822	CAPILLARY ASSY OU8-30 R410A RC	1	15
433829	TUBING ASSY OU8-30 R410A	1	16
402494	BOARD TPHN 3C	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
437278	COMPRESSOR WIRING OU7/8-3PH	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439928	OUTLET PLASTIC RING OU8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439795	3PH MOTOR PROTECTOR	1	25
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33

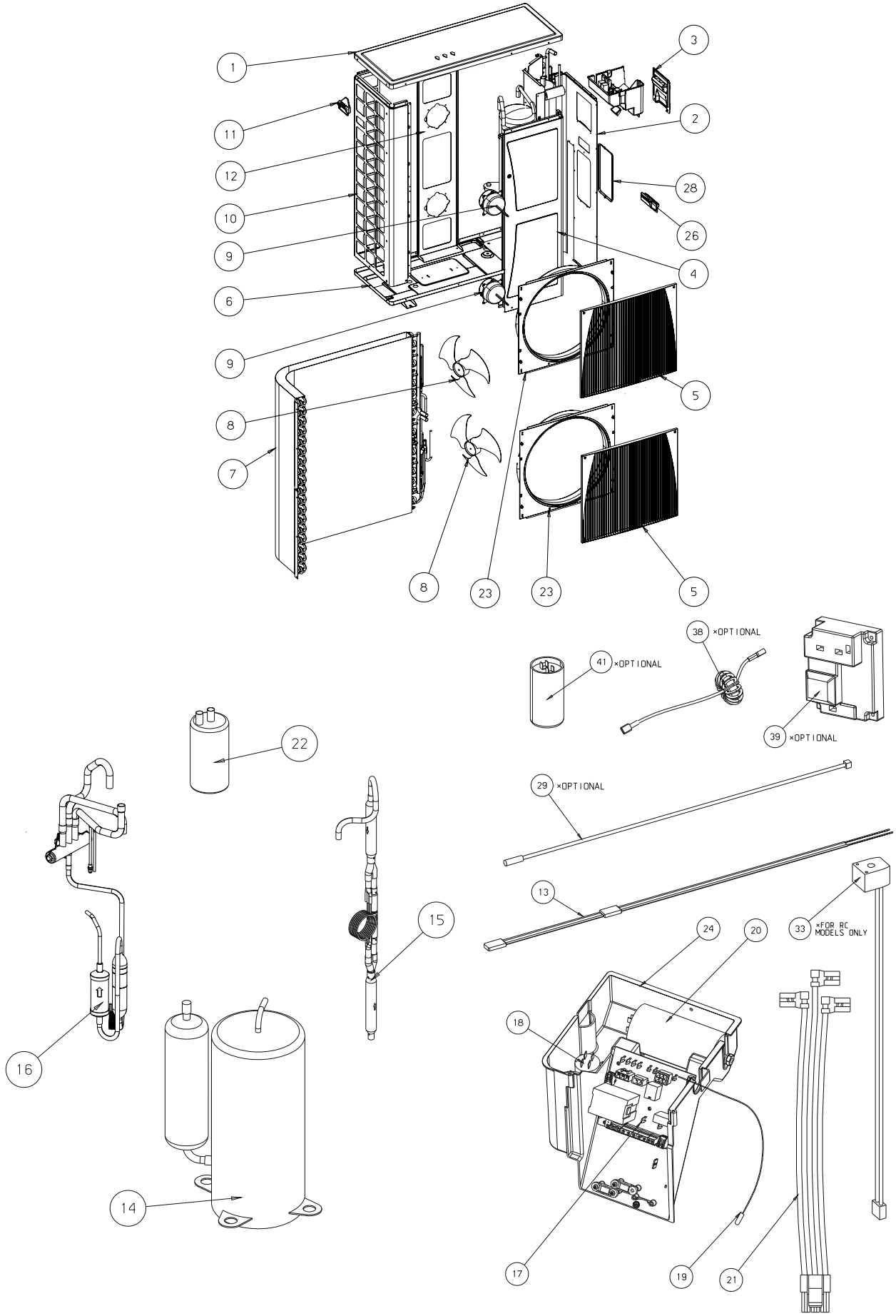
15.31 Outdoor Unit: GCN 30 ST 3PH



15.32 Outdoor Unit: GCN 30 ST 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433705	NEW BASE ASSY OU 2005 LOCAL	1	6
433834	COIL OU8-30 ST GR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433298	COMPRESSOR NN33YCAMT	1	14
433830	CAPILLARY ASSY OU8-30 R410A ST	1	15
433833	TUBING ASSY OU8-30 ST R410A	1	16
402494	BOARD TPHN 3C	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
437278	COMPRESSOR WIRING OU7/8-3PH	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439928	OUTLET PLASTIC RING OU8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439795	3PH MOTOR PROTECTOR	1	25
439656	SIDE COVER OU-8/10	1	28

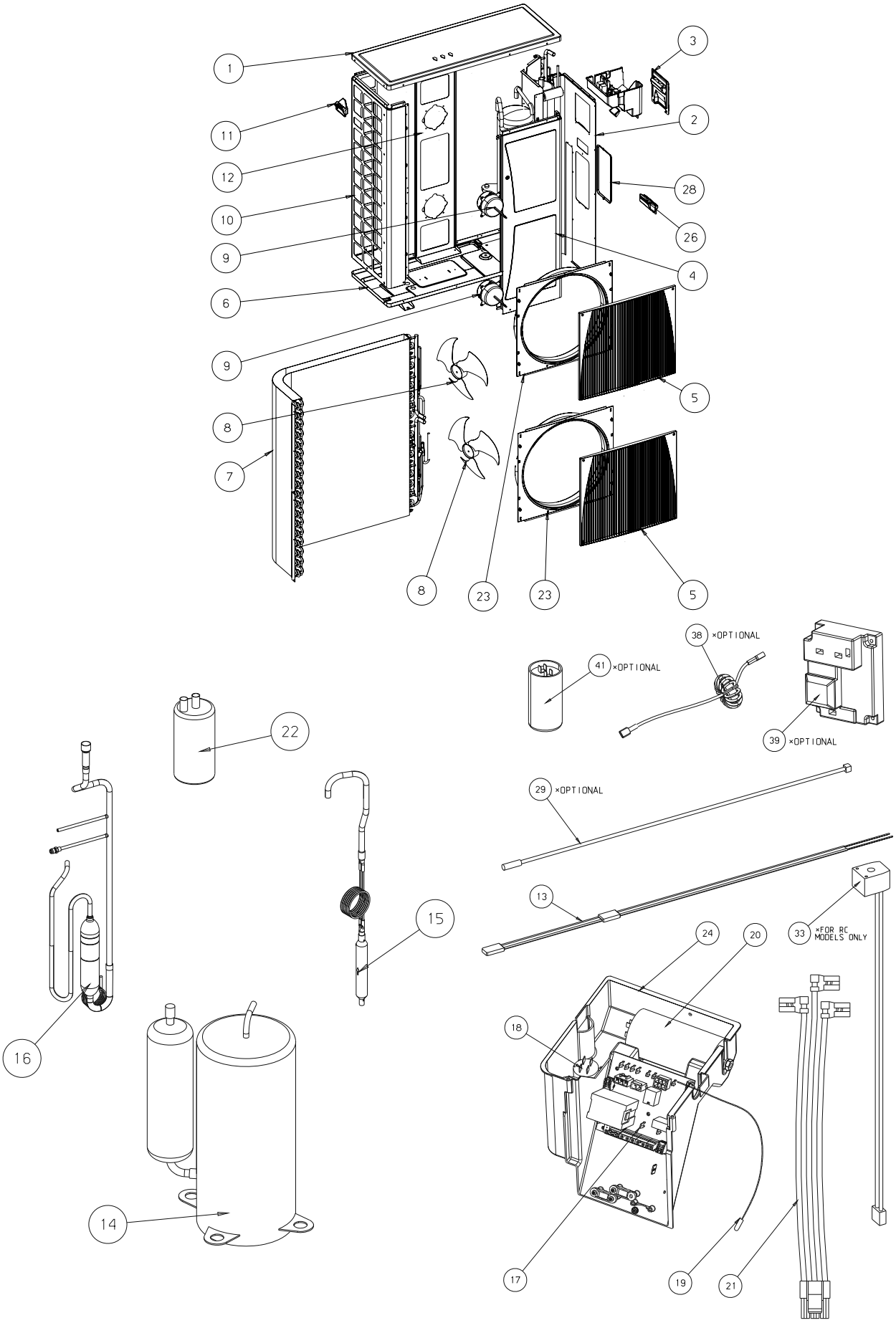
15.33 Outdoor Unit: GCN 37 RC 1PH



15.34 Outdoor Unit: GCN 37 RC 1PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
439655	SIDE PANEL OU10	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439653	FRONT PANEL OU10	1	4
439662	GRILLE OU10	2	5
433294	NEW BASE ASSY OU 2005 EXPORT	1	6
433854	COIL OU10-36 GR HDR R410A	1	7
439650	AXIAL FAN D400*112	2	8
439865	MOTOR 70W,3S,OU10-38	2	9
430838	SIDE NET PANEL EL13 OU10-44Z	1	10
436358	OU LEADING HANDLE	1	11
439657	MOTOR SUPPORT OU10	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433279	COMPRESSOR NN40VAAMT	1	14
433857	CAPILLARY ASSY OU10-36 R410A	1	15
433967	TUBING ASSY OU10-36 R410A	1	16
402495	BOARD TPHN 5B	1	17
442017	CAPACITOR 3mF 400V P1/P2	2	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442010	CAPACITOR 60mF 400V P1/P2	1	20
437279	COMPRESSOR WIRING OU10-1PH	1	21
402189	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439661	CONES OU10	2	23
437229	ELECTRICAL BOX TPHN	1	24
436352	RAISING HANDLE OU10	1	26
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33

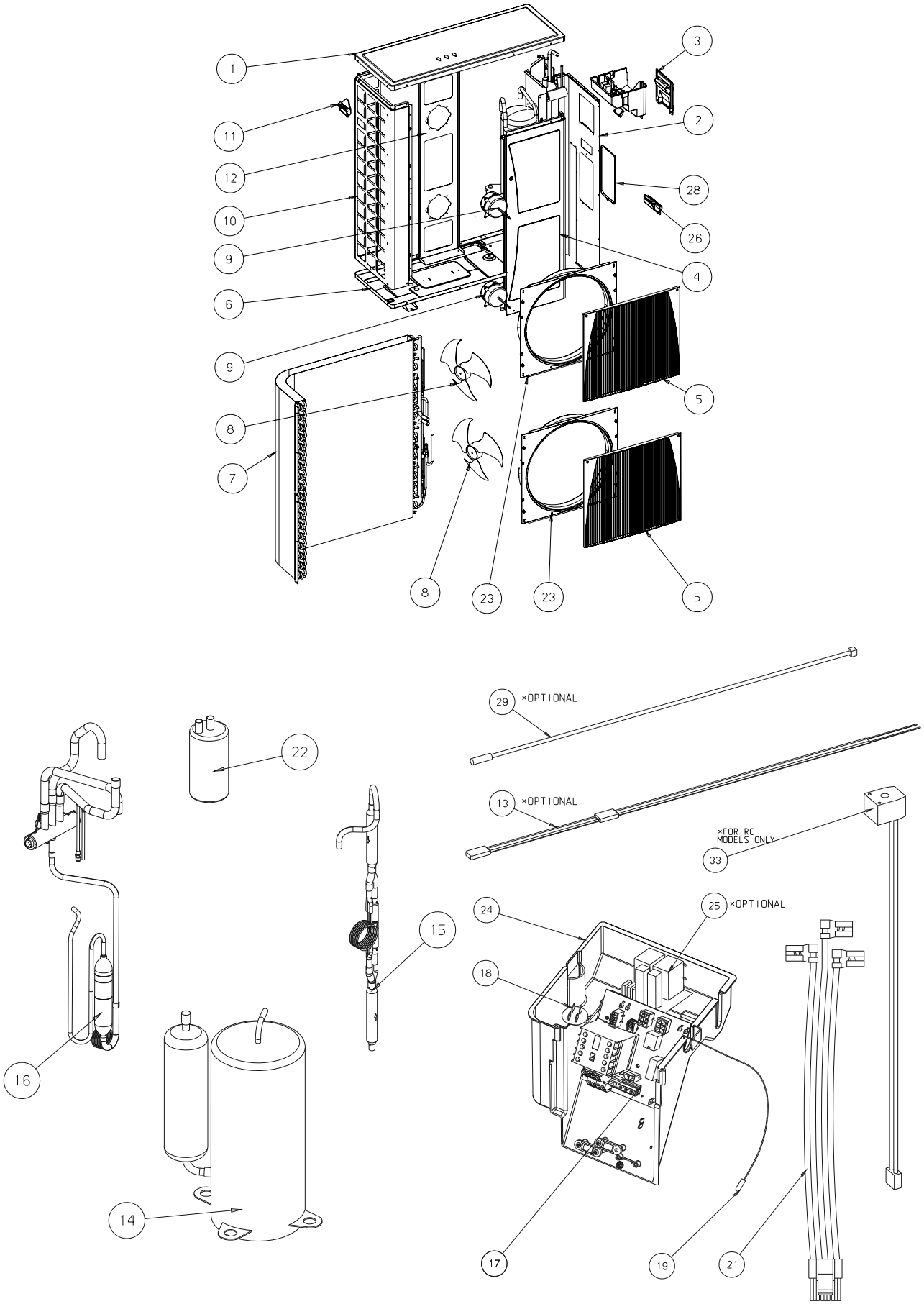
15.35 Outdoor Unit: GCN 37 ST 1PH



15.36 Outdoor Unit: GCN 37 ST 1PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
439655	SIDE PANEL OU10	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439653	FRONT PANEL OU10	1	4
439662	GRILLE OU10	2	5
433705	NEW BASE ASSY OU 2005 LOCAL	1	6
433868	COIL OU10-36 ST GR R410A	1	7
439650	AXIAL FAN D400*112	2	8
439865	MOTOR 70W,3S,OU10-38	2	9
430838	SIDE NET PANEL EL13 OU10-44Z	1	10
436358	OU LEADING HANDLE	1	11
439657	MOTOR SUPPORT OU10	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433279	COMPRESSOR NN40VAAMT	1	14
433872	CAPILLARY ASSY OU10-36 ST R410	1	15
433873	TUBING ASSY OU10-36 ST R410A	1	16
402495	BOARD TPHN 5B	1	17
442017	CAPACITOR 3mF 400V P1/P2	2	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442010	CAPACITOR 60mF 400V P1/P2	1	20
437279	COMPRESSOR WIRING OU10-1PH	1	21
402189	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439661	CONES OU10	2	23
437229	ELECTRICAL BOX TPHN	1	24
436352	RAISING HANDLE OU10	1	26
439656	SIDE COVER OU-8/10	1	28

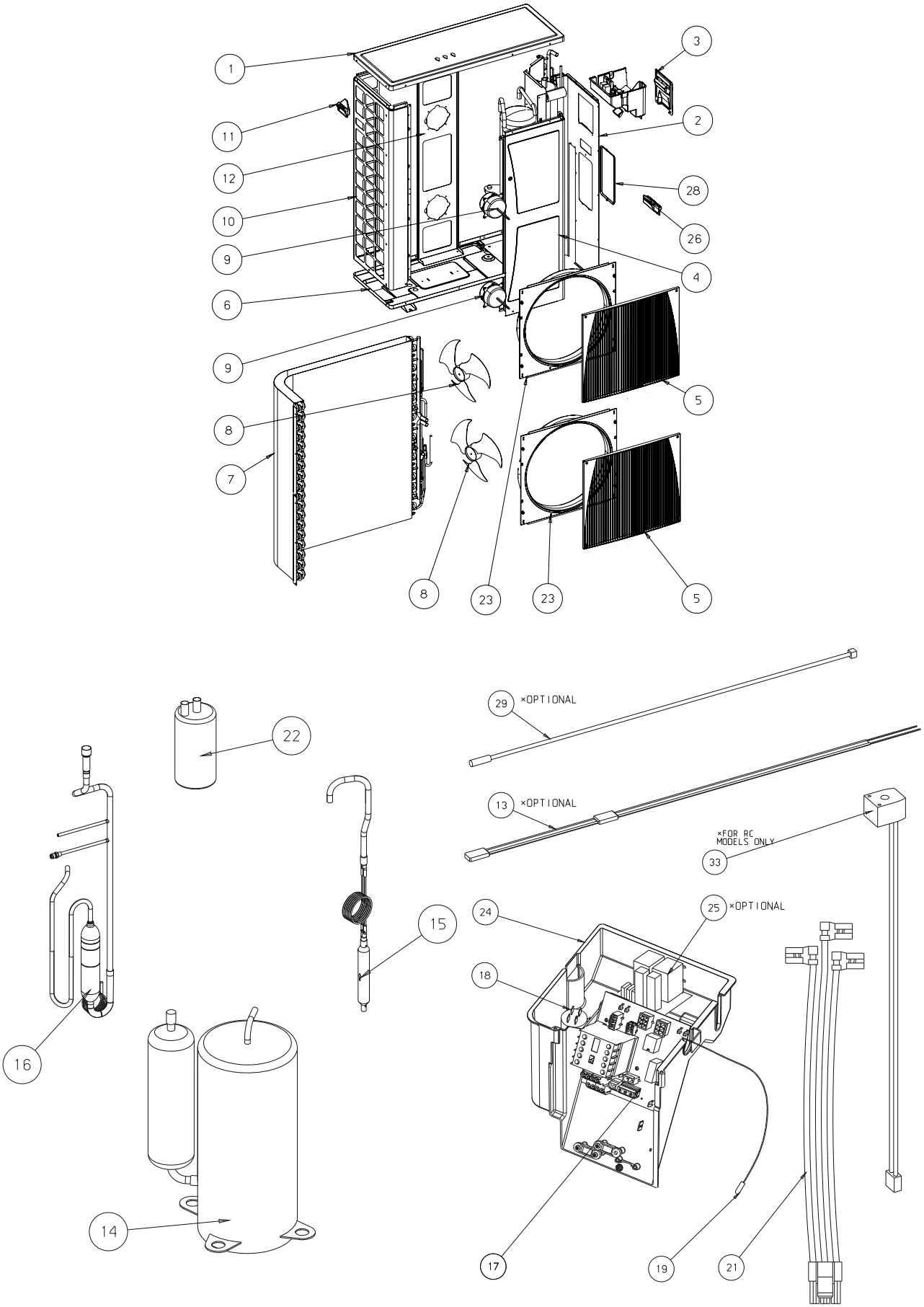
15.37 Outdoor Unit: GCN 37 RC 3PH



15.38 Outdoor Unit: GCN 37 RC 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
439655	SIDE PANEL OU10	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439653	FRONT PANEL OU10	1	4
439662	GRILLE OU10	2	5
433294	NEW BASE ASSY OU 2005 EXPORT	1	6
433854	COIL OU10-36 GR HDR R410A	1	7
439650	AXIAL FAN D400*112	2	8
439865	MOTOR 70W,3S,OU10-38	2	9
430838	SIDE NET PANEL EL13 OU10-44Z	1	10
436358	OU LEADING HANDLE	1	11
439657	MOTOR SUPPORT OU10	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433855	COMPRESSOR NN40YCAMT	1	14
433857	CAPILLARY ASSY OU10-36 R410A	1	15
433865	TUBING ASSY OU10-36 R410A	1	16
402494	BOARD TPHN 3C	1	17
442017	CAPACITOR 3mF 400V P1/P2	2	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
437280	COMPRESSOR WIRING OU10-3PH	1	21
402189	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439661	CONES OU10	2	23
437229	ELECTRICAL BOX TPHN	1	24
439795	3PH MOTOR PROTECTOR	1	25
436352	RAISING HANDLE OU10	1	26
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33

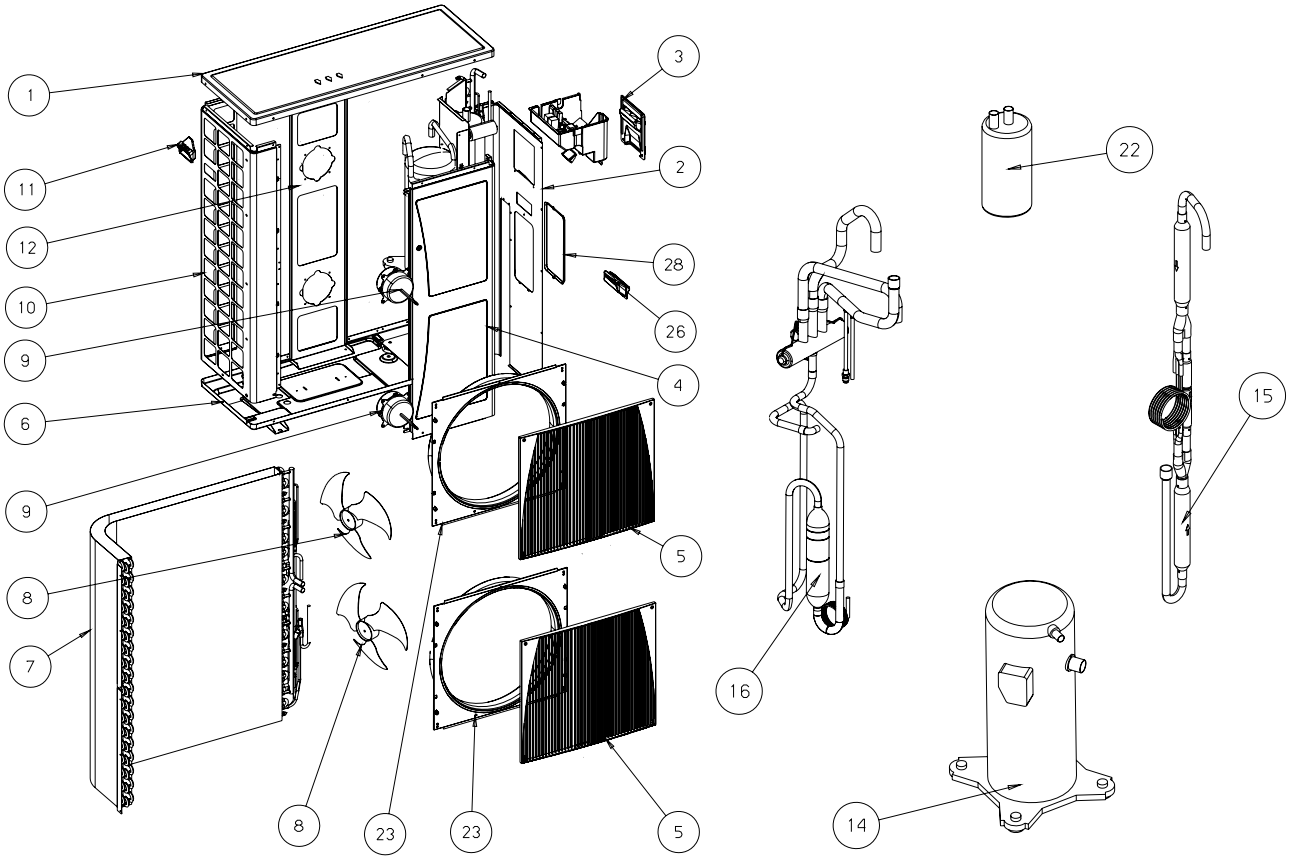
15.39 Outdoor Unit: GCN 37 ST 3PH

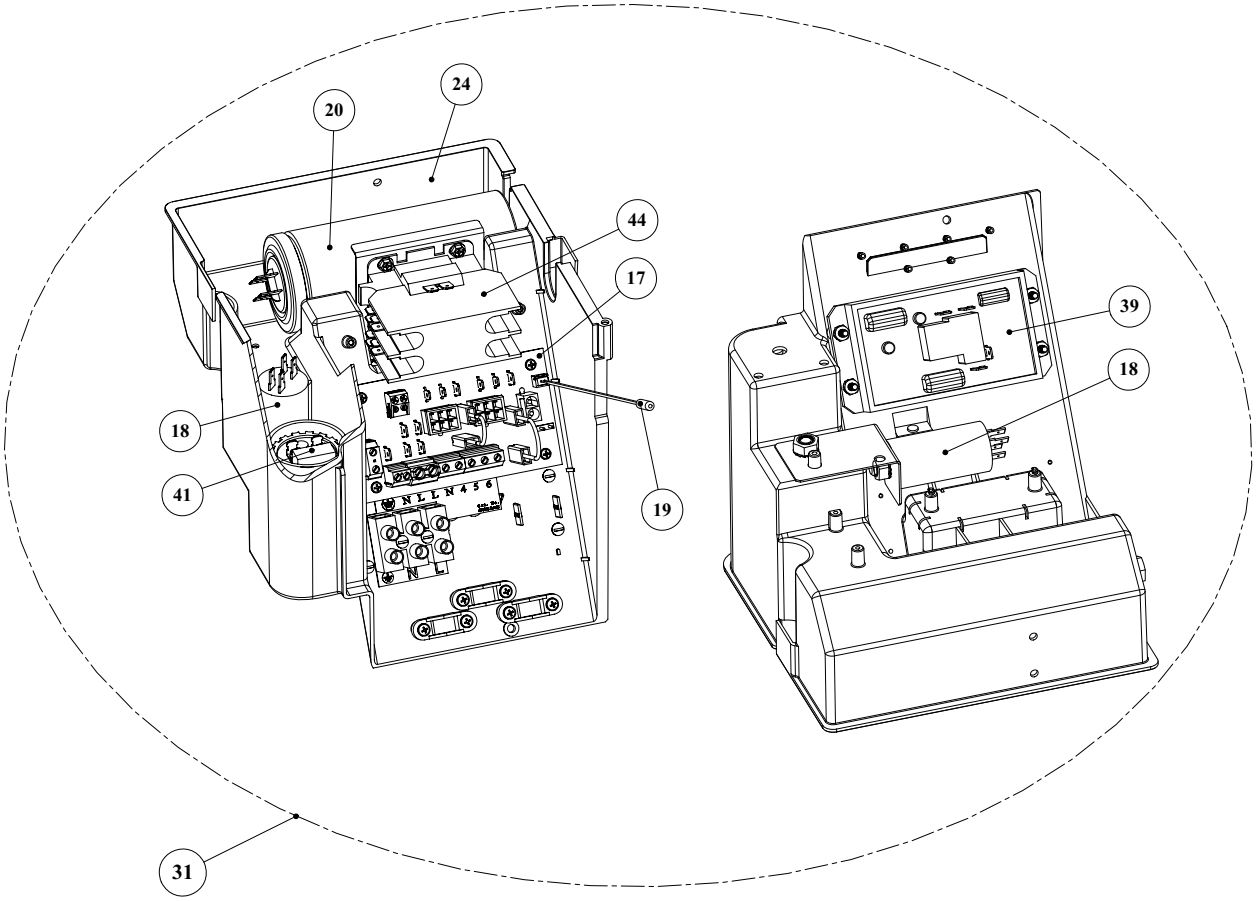


15.40 Outdoor Unit: GCN 37 ST 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
439655	SIDE PANEL OU10	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439653	FRONT PANEL OU10	1	4
439662	GRILLE OU10	2	5
433705	NEW BASE ASSY OU 2005 LOCAL	1	6
433868	COIL OU10-36 ST GR R410A	1	7
439650	AXIAL FAN D400*112	2	8
439865	MOTOR 70W,3S,OU10-38	2	9
430838	SIDE NET PANEL EL13 OU10-44Z	1	10
436358	OU LEADING HANDLE	1	11
439657	MOTOR SUPPORT OU10	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433855	COMPRESSOR NN40YCAMT	1	14
433872	CAPILLARY ASSY OU10-36 ST R410	1	15
433873	TUBING ASSY OU10-36 ST R410A	1	16
402494	BOARD TPHN 3C	1	17
442017	CAPACITOR 3mF 400V P1/P2	2	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
437280	COMPRESSOR WIRING OU10-3PH	1	21
402189	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439661	CONES OU10	2	23
437229	ELECTRICAL BOX TPHN	1	24
439795	3PH MOTOR PROTECTOR	1	25
436352	RAISING HANDLE OU10	1	26
439656	SIDE COVER OU-8/10	1	28

15.41 Outdoor Unit: GCN 42 RC 1PH

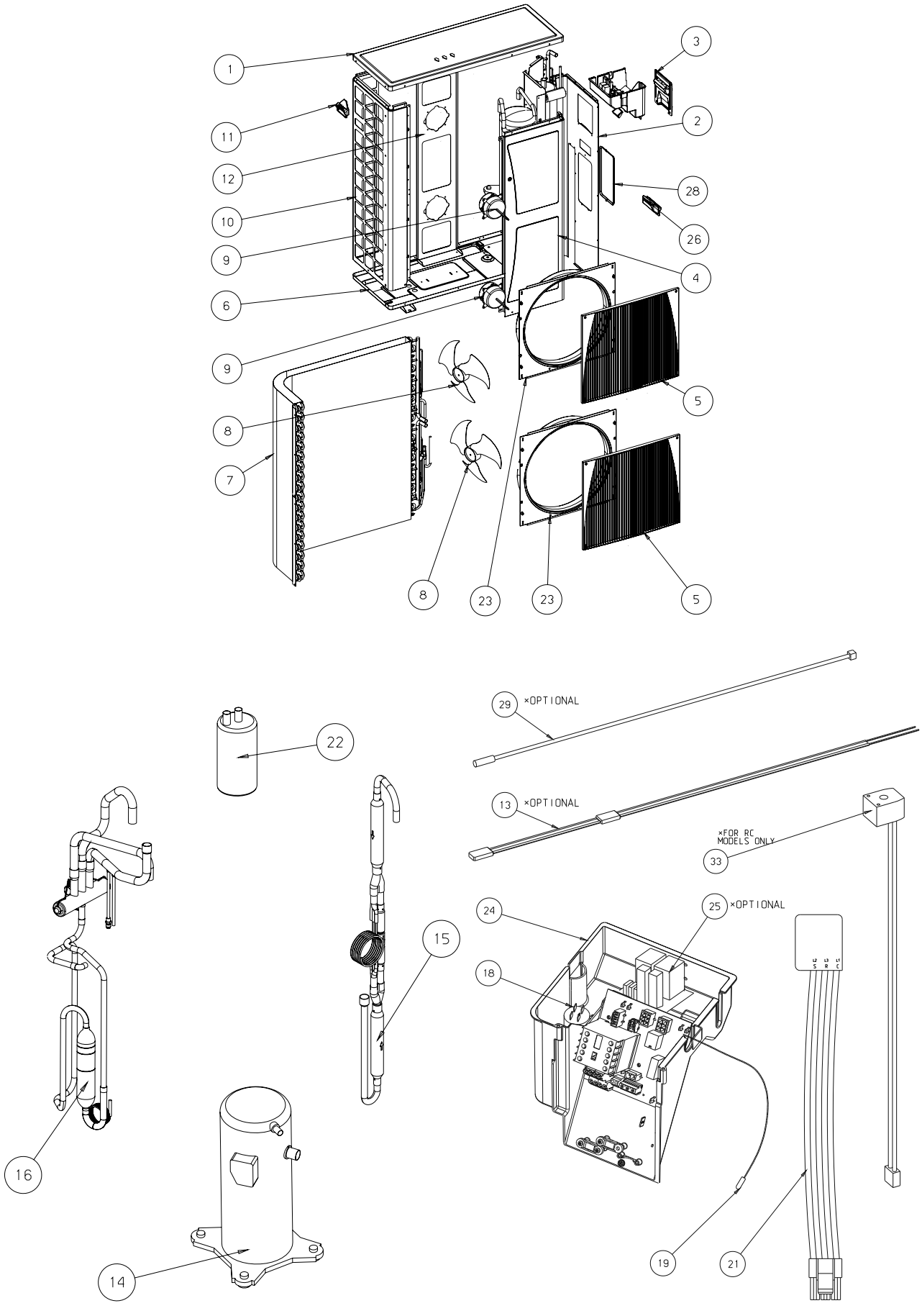




15.42 Outdoor Unit: GCN 42 RC 1PH

No.	Item Code	Description	Quantity
1	437045	LARGE UPPER COVER CUE	1
2	439655	SIDE PANEL OU10	1
3	436357	SMALL ELECTRICAL COVER CUE	1
4	439653	FRONT PANEL OU10	1
5	439662	GRILLE OU10	2
6	439833	NEW BASE ASSY OU	1
7	433875	COIL OU10-47 GR HDR R410A	1
8	439650	AXIAL FAN D400*112	2
9	439651	MOTOR 70W3SOU10	2
10	430838	SIDE NET PANEL EL13 OU10-44Z	1
11	436358	TRANSPORT HANDLE CUE	1
12	439657	MOTOR SUPPORT OU10	1
12	456700	MOTOR SUPPORT BRACKET OU10-47	1
13	190442	HEATER CRANKCASE OU10 LG	1
14	438797	COMPRESSOR ZP50K3E-PFJ	1
15	456702	CAPILLARY ASSY OU10-47 RC R410A	1
16	438847	TUBING ASSY OU10-42 R410A	1
17	413496	BOARD TPHN 5F (RoHS)	1
18a	442017	CAPACITOR 3mF 400V P1/P2	2
19a	434716	THERMISTOR L1050 (for coil)	1
20	442039	CAPACITOR 80mF 400V P1/P2	1
22	402284	SUCTION ACCUMULATOR 5 x 3/4 7Lb R410A	1
23	439661	CONES OU10	2
24	437229	ELECTRICAL BOX TPHN	1
26	436352	RAISING HANDLE OU10	1
28	439656	SIDE COVER OU10	1
31	437347	ELECTRICAL ASSY OU10-42 R410A	1
33	442466	4 way valve Coil Sanhua	1
39	433650	BIG SOFT STARTER	1
41	442022	SOFT STARTER CAPACITOR 161-193mF 275V P1	1
44	192207	CONTACTOR 230V, 40A	1
45	433783	WIRING CONNECTION OU10-42	1

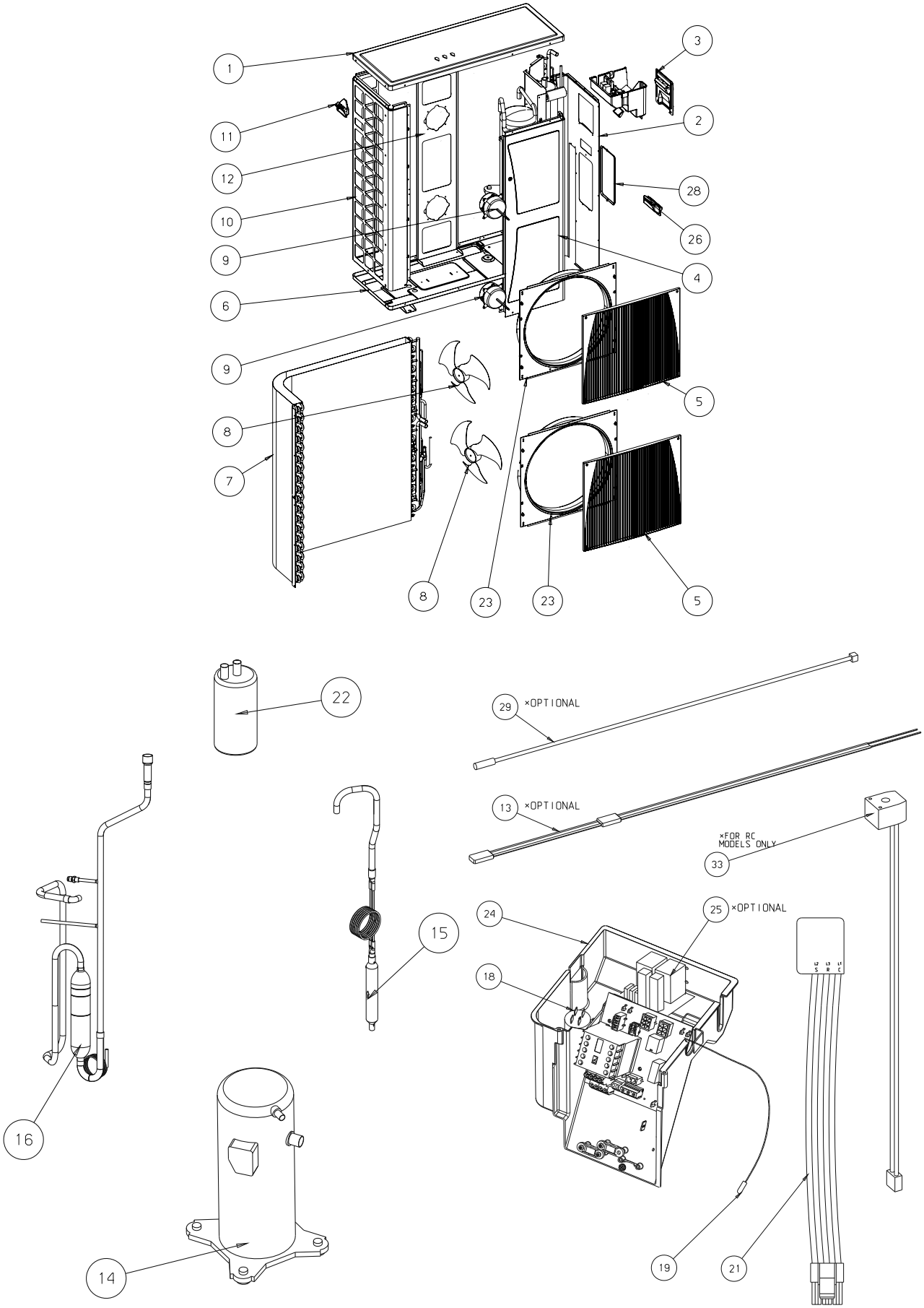
15.43 Outdoor Unit: GCN 40 RC 3PH



15.44 Outdoor Unit: GCN 40 RC 3PH

No.	Part No.	Description	Qty
1	437045	UPPER COVER EL13 OU LARGE	1
2	439655	SIDE PANEL OU10	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	439653	FRONT PANEL OU10	1
5	439662	GRILLE OU10	2
6	439833	NEW BASE ASSY OU EXPORT	1
7	433875	COIL OU10-47 GR HDR R410A	1
8	439650	AXIAL FAN D400*112	2
9	439651	MOTOR 70W,3S,OU10-50	2
10	430838	SIDE NET PANEL EL13 OU10-44Z	1
11	436358	OU LEADING HANDLE	1
12	439657	MOTOR SUPPORT OU10	1
13	190442	HEATER CRANKCASE OU10 LG	1
14	438764	COMPRESSOR ARA053YAA	1
15	456702	CAPILLARY ASSY OU10-47 RC R410	1
16	456699	TUBING ASSY OU10-47 R410A	1
17	402494	BOARD TPHN 3C	1
18a	442017	CAPACITOR 3mF 400V P1/P2	2
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
21	435545	COMPRESSOR WIRING WTH PLUG L12	1
22	402284	SUCTION ACCUMULATOR 5” x 3/4”	1
23	439661	CONES OU10	2
24	437229	ELECTRICAL BOX TPHN	1
25	439795	3PH MOTOR PROTECTOR	1
26	436352	RAISING HANDLE OU10	1
28	439656	SIDE COVER OU-8/10	1
33	442466	VALVE COIL L700 MOLEX-SANHUA	1

15.45 Outdoor Unit: GCN 40 ST 3PH



15.46 Outdoor Unit: GCN 40 ST 3PH

No.	Part No.	Description	Qty
1	437045	UPPER COVER EL13 OU LARGE	1
2	439655	SIDE PANEL OU10	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	439653	FRONT PANEL OU10	1
5	439662	GRILLE OU10	2
6	439841	NEW BASE ASSY OU LOCAL	1
7	433875	COIL OU10-47 GR HDR R410A	1
8	439650	AXIAL FAN D400*112	2
9	439651	MOTOR 70W,3S,OU10-50	2
10	430838	SIDE NET PANEL EL13 OU10-44Z	1
11	436358	OU LEADING HANDLE	1
12	439657	MOTOR SUPPORT OU10	1
13	190442	HEATER CRANKCASE OU10 LG	1
14	438764	COMPRESSOR ARA053YAA	1
15	456704	CAPILLARY ASSY OU10-47 ST R410	1
16	456705	TUBING ASSY OU10-47 ST R410A	1
17	402494	BOARD TPHN 3C	1
18a	442017	CAPACITOR 3mF 400V P1/P2	2
19a	434716	THERMISTOR+CAP WTH CONNECTOR L	1
21	435545	COMPRESSOR WIRING WTH PLUG L12	1
22	402284	SUCTION ACCUMULATOR 5” x 3/4”	1
23	439661	CONES OU10	2
24	437229	ELECTRICAL BOX TPHN	1
25	439795	3PH MOTOR PROTECTOR	1
26	436352	RAISING HANDLE OU10	1
28	439656	SIDE COVER OU-8/10	1

16. OPTIONAL ACCESSORIES

16.1 INSTALLATION INSTRUCTION FOR DLS ELECTRICAL HEATER KITS

1. ATTENTION

1. **Selection of the unit's location.**
   Select a location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.
2. **Installation work.**
   It may need two people to carry out the installation work.
3. **Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.**

2. SAFETY PRECAUTION

Read the following "SAFETY PRECAUTION" carefully before installation.
Electric work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be installed.
The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below.
Incorrect installation due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.
Carry out test running to confirm that no abnormally occurs after the installation.

The items to be followed are classified by the symbols:

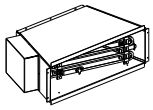
WARNING
This indication shows the possibility of causing death or serious injury.

Symbols with background white denotes item that is PROHIBITED from doing.

3. WARNING

1. **Use qualified installer and follow careful this instructions, otherwise it will cause electrical shock.**
2. **Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.**
3. **For electrical work, follow the local national wiring standard, regulation and this installation instruction. An independent circuit is not enough it will cause electrical shock or fire.**
4. **Use the specified cable and connect tightly for unit connection. Connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.**
5. **Wire routing must be properly arranged so that control board cover is fixed properly.**
   If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.
6. **Do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.**
7. **This equipment must be earthed. It may cause electrical shock if grounding is not perfect.**
8. **Do not install the unit at place where leakage of flammable gas may occur. Incase of gas leaks and accumulates at surrounding of the unit, it may cause fire**

4. KIT contains:

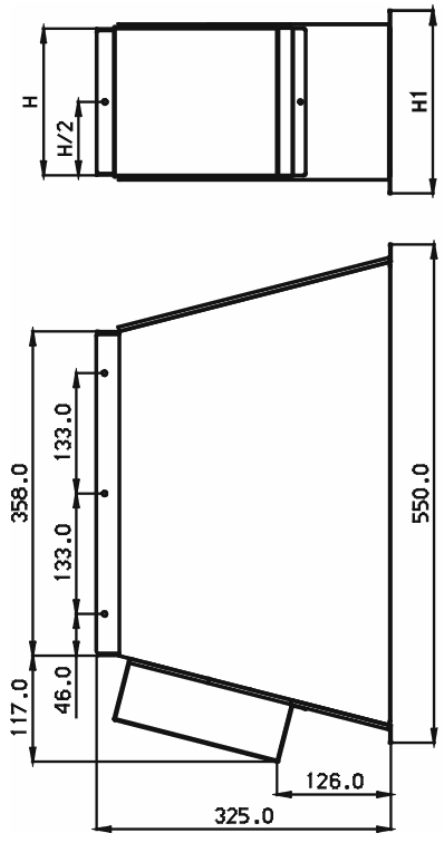
	DESCRIPTION	PICTURE	QANTITY
1	HEATER UNIT		1
2	MODEL PLUG (K-SH)		1
3	SCREWS AB8*1/2		8

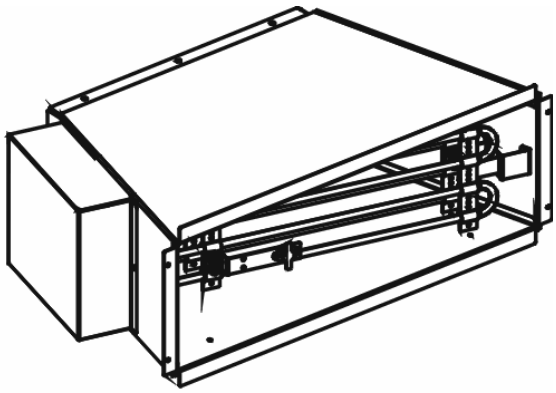
5. Technical Specification:

	HEATER CAPACITY	INDOOR UNIT APPLICATION	POWER SUPLY	PUWER SUPPLY WIRE SECTION	CIRCUIT BREAKER RATING
1	2kW	5kW, 7kW	Separated, 230V/1PH/50Hz	1.5 mm^{2*}	12A
2	3kW	9kW			16A
3	4kW	10.5kW, 12.5kW		2.5 mm^{2*}	25A

*** For main power supply use only cable H05RN-F type. Always follow local national wiring standards regulation.**

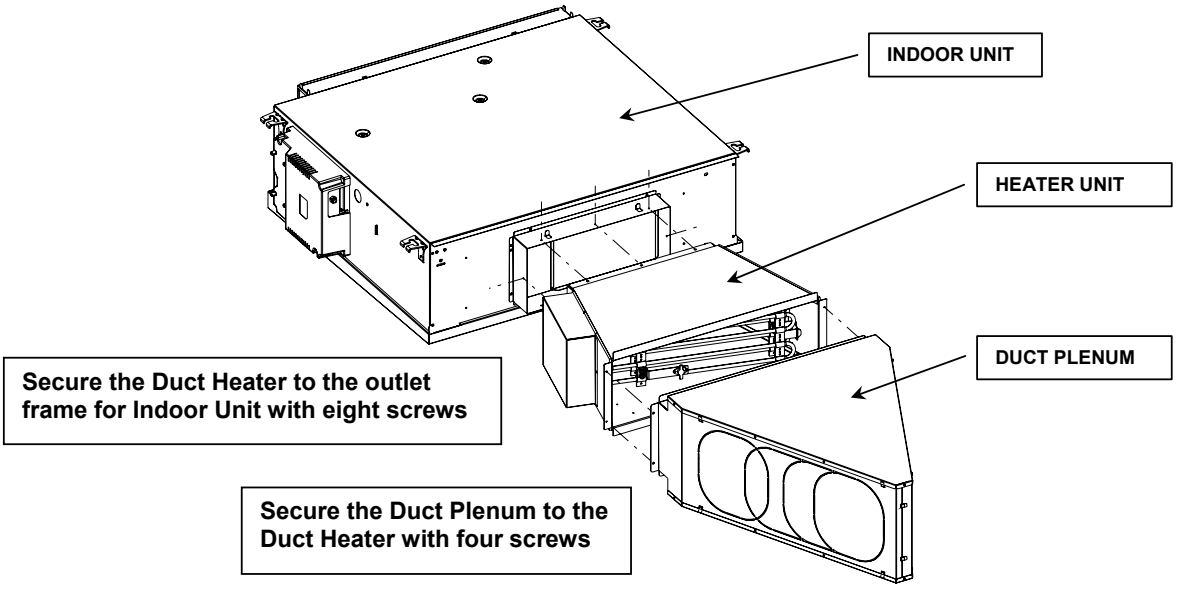
6. Outline Dimensions:





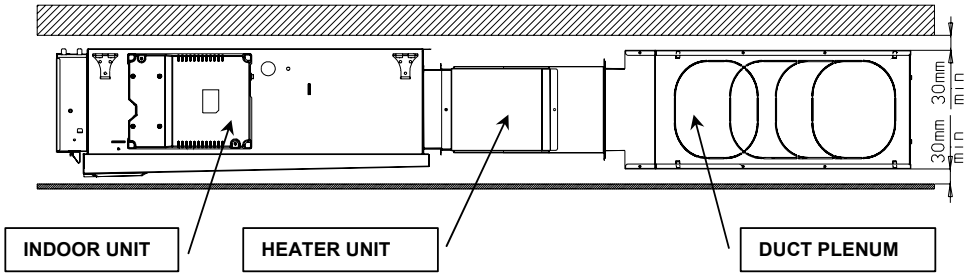
HEATER CAPACITY	DIMENSIONS, mm	
	H	H1
2kW, 3kW	162	202
4kW	193	233

7. Assembly to the Indoor unit:

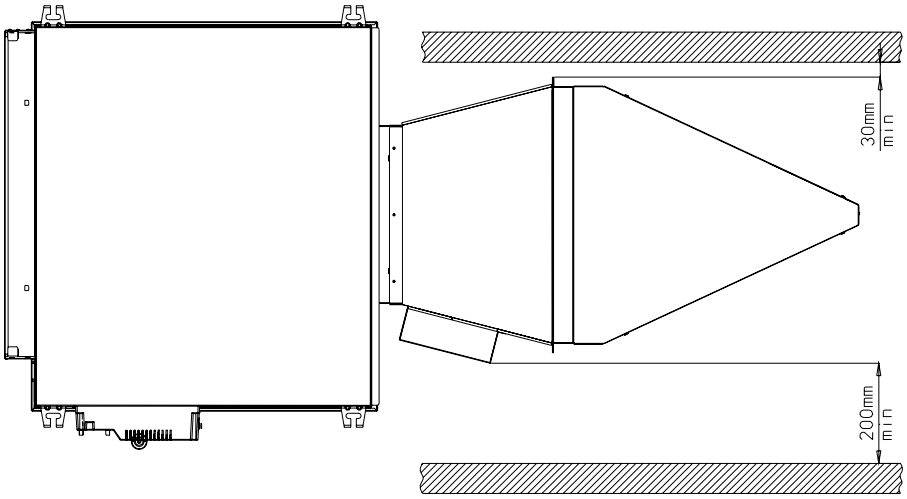

INDOOR UNIT
HEATER UNIT
DUCT PLENUM
Secure the Duct Heater to the outlet frame for Indoor Unit with eight screws
Secure the Duct Plenum to the Duct Heater with four screws

8. Assembly section:

SIDE VIEW

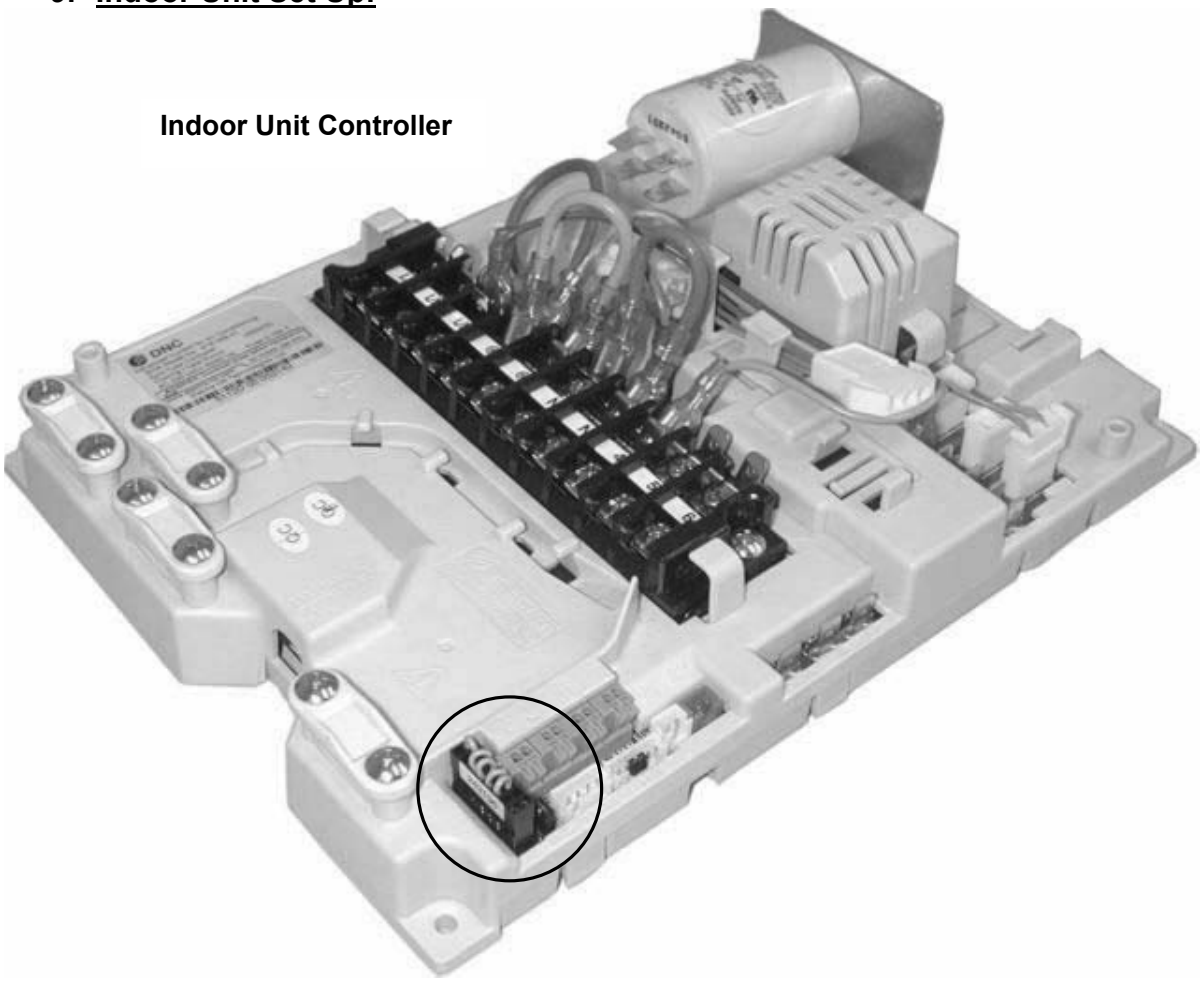


TOP VIEW

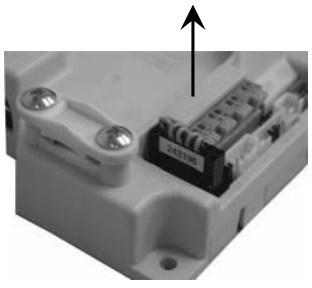


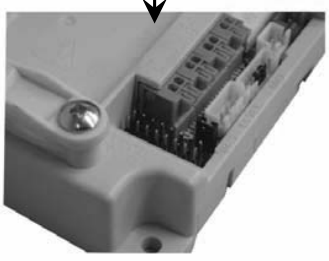
9. Indoor Unit Set Up:

Indoor Unit Controller



CAUTION
Be careful to install the MODEL PLUG in right direction (MANDATORY line up the arrows)



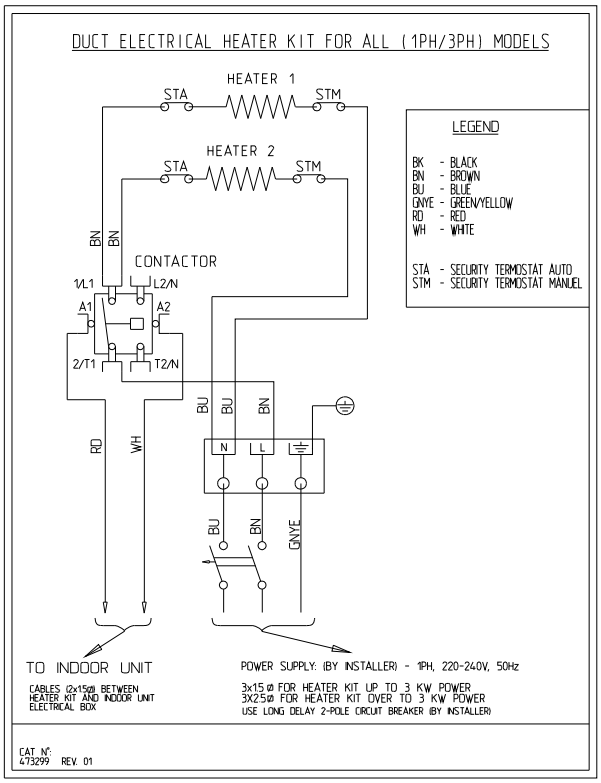


1. Disconnect exiting MODEL PLUG

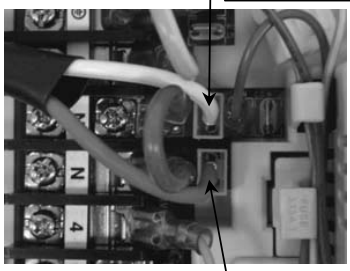
2. Convince that all contact pins are straight lines

3. Connect new (supplied with Duct Heater) MODEL PLUG

10. Electrical connections:



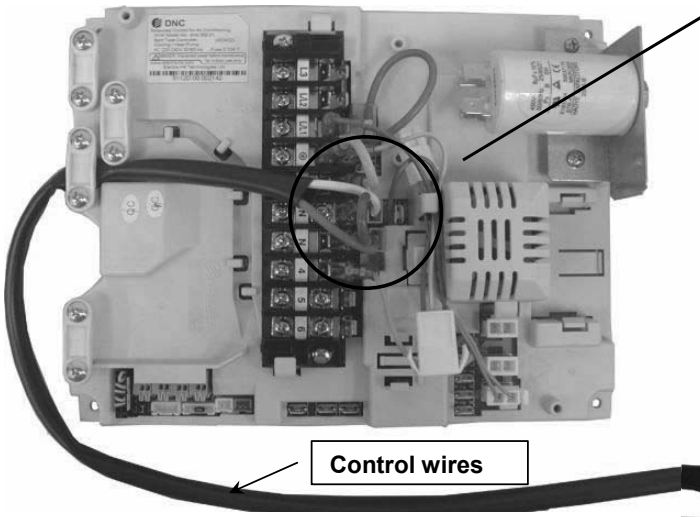
CAUTION
All electrical connections, it is necessary to carry out according to the electric diagram.



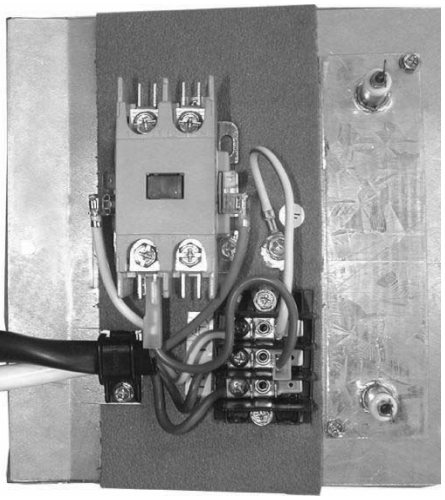
Tab "HE N"

Tab "HE"

Indoor Unit Controller



Heater Controller



Control wires

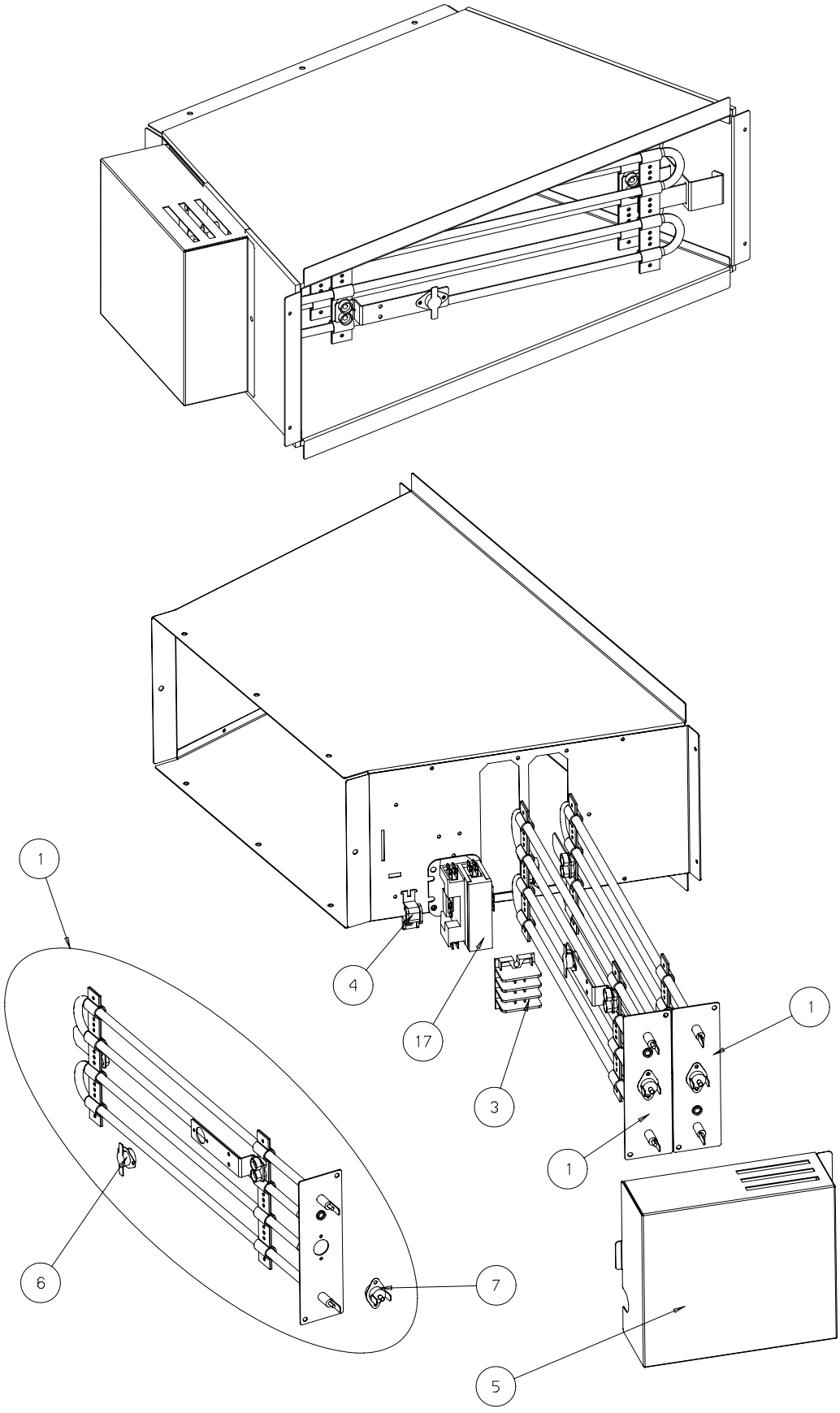
Connect the control wires (supplied with Duct Heater, L=1500mm) to Controller of Indoor unit:
Red wire to Tab "HE"
White wire to Tab "HE N"

Power Supply Cable

Connect the power cable (not supplied) to terminal block of Duct Heater

11. ELECTRICAL HEATER KIT EXPLODED VIEW

SERIES: DLS−DLS 2kW, 3kW, 4kW



12. SPARE PARTS LIST

DLS−DLS 18-24 (2kW)

No.	Draw. No.	Item	Description	Quantity	Revision
1	1	473285	DNG HEATER ASSY 1KW	1	1
2	3	437253	TERMINAL BLOCK RW52-3 / H+C	2	1
3	4	436189	CABLE CLAMP	1	1
4	5	473291	ELECTRIC BOX COVER DNG HEATER	1	1
5	6	473282	SAFETY THERMOSTAT "AUTO RESET" 80C 15A	1	1
6	7	473283	SAFETY THERMOSTAT "MANUAL RESET" 90C 15A	1	1
7	17	192207	CONTACTOR 230V, 40A	1	1

DLS−DLS 30 (3kW)

No.	Draw. No.	Item	Description	Quantity	Revision
1	1	473286	DNG HEATER ASSY 1.5KW	1	1
2	3	437253	TERMINAL BLOCK RW52-3 / H+C	2	1
3	4	436189	CABLE CLAMP	1	1
4	5	473291	ELECTRIC BOX COVER DNG HEATER	1	1
5	6	473282	SAFETY THERMOSTAT "AUTO RESET" 80C 15A	1	1
6	7	473283	SAFETY THERMOSTAT "MANUAL RESET" 90C 15A	1	1
7	17	192207	CONTACTOR 230V, 40A	1	1

DLS−DLS 37-44 (4kW)

No.	Draw. No.	Item	Description	Quantity	Revision
1	1	473287	DNG HEATER ASSY 2KW	1	1
2	3	437253	TERMINAL BLOCK RW52-3 / H+C	2	1
3	4	436189	CABLE CLAMP	1	1
4	5	473291	ELECTRIC BOX COVER DNG HEATER	1	1
5	6	473284	SAFETY THERMOSTAT "AUTO RESET" 90C 15A	1	1
6	7	473283	SAFETY THERMOSTAT "MANUAL RESET" 90C 15A	1	1
7	17	192207	CONTACTOR 230V, 40A	1	1

All Season Kit Installation Instruction

Switch off power supply to the unit

Fig.1

- Remove:
  - Cover **A;**
  - Power panel handle **B;**
  - Side cover **C** (if it exist).

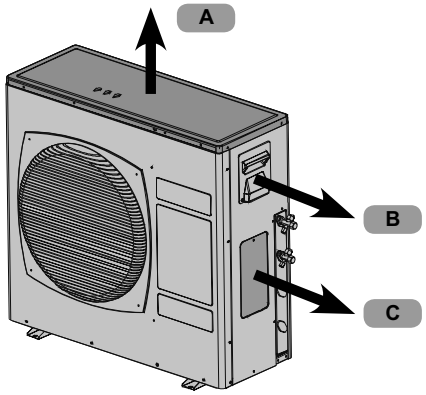


Fig.1

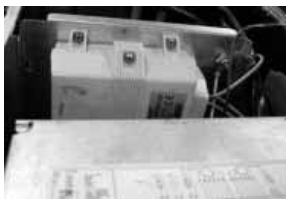
Fig.2

- Mount the Fan speed controller on the partition of the compressor compartment in the holes provided, using four supplied screws .

Note:

- In outdoor models OU8, the Fan Speed Controller should be mounted on the partition toward the outdoor fan motor side.

OU7



OU10

OU8

Fig.2

Fig.3

- Unscrew the cap of the provided service valve **D** and connect to the **T-valve**, supplied in the kit. Use Copper sealing gasked between the flare nut and it's connection to service valve **D**.

Note:

- The **"T-valve"** supplied in the kit is installed between valve **D** and capillary **E** offering the possibility of an additionall pressure connecting output for service.

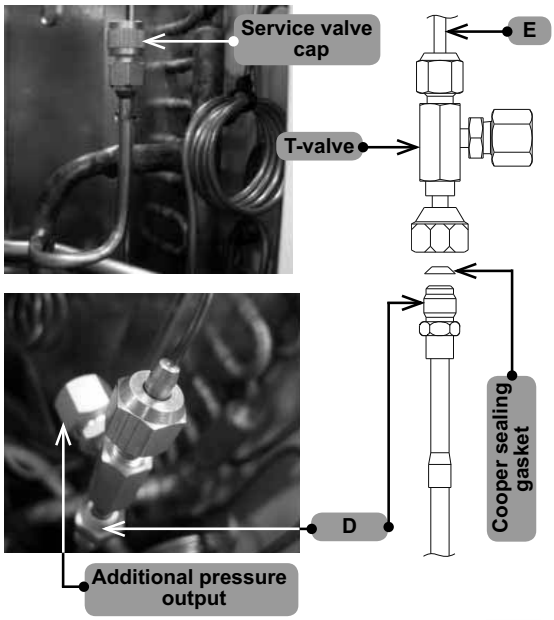


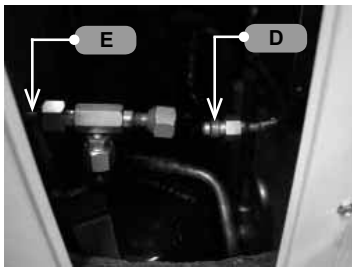
Fig.3

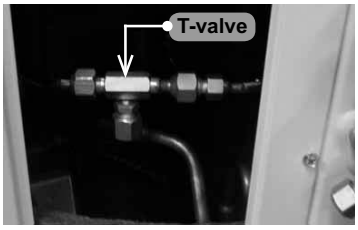
Fig.4

- Connect capillary **E** to **T-valve**.
  Use Copper sealing gasket between the flare nut and the connection to **T-valve.**

Note:

- Installing the Copper sealing gasket is mandatory in order to avoid refrigerant leak.





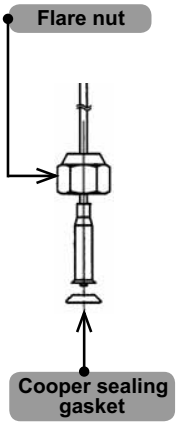
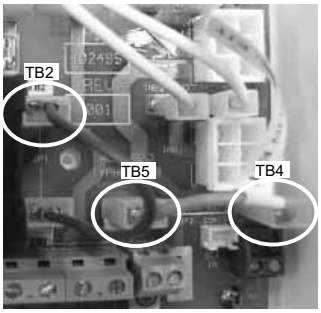


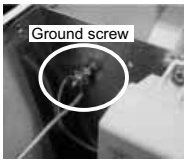
Fig.4

Fig.5

Electrical connections for 1PH units:

- Disconnect the wire from point “6” on main terminal outdoor PCB Typhoon and isolate it with isolation tape.
- Disconnect the JP1 and JP2 wires from tabs TB2; TB4; TB5 on PCB Typhoon.
  Connect the Red Wire from Fan Speed Controller to tab “TB4” on PCB Typhoon.
- Connect Green Wire from Fan Speed Controller to tab “TB2” on PCB Typhoon.
- Connect Y/Green wire from Fan Speed Controller to ground screw on units partition.
- Return “JP1” wire, previously disconnected, to tab “TB2”.





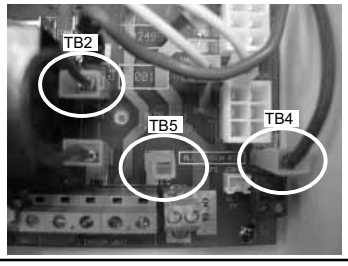
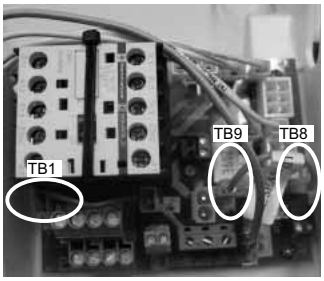


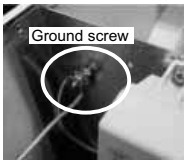
Fig.5

Fig.6

Electrical connections for 3PH units:

- Disconnect the wire from point “6” on main terminal PCB Typhoon and isolate it with isolation tape.
- Disconnect the JP1 and JP2 wires from tabs TB1; TB8; TB9 on PCB Typhoon.
- Connect Red Wire from Fan Speed Controller to tab “TB8” on PCB Typhoon.
- Connect Green Wire from Fan Speed Controller to Tab “TB1” on PCB Typhoon.
- Connect Y/Green wire from Fan Speed Controller to ground screw on units partition.
- Return “JP1” wire, previously disconnected, to tab “TB1”.





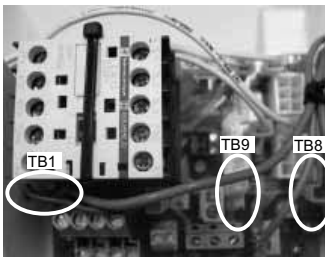
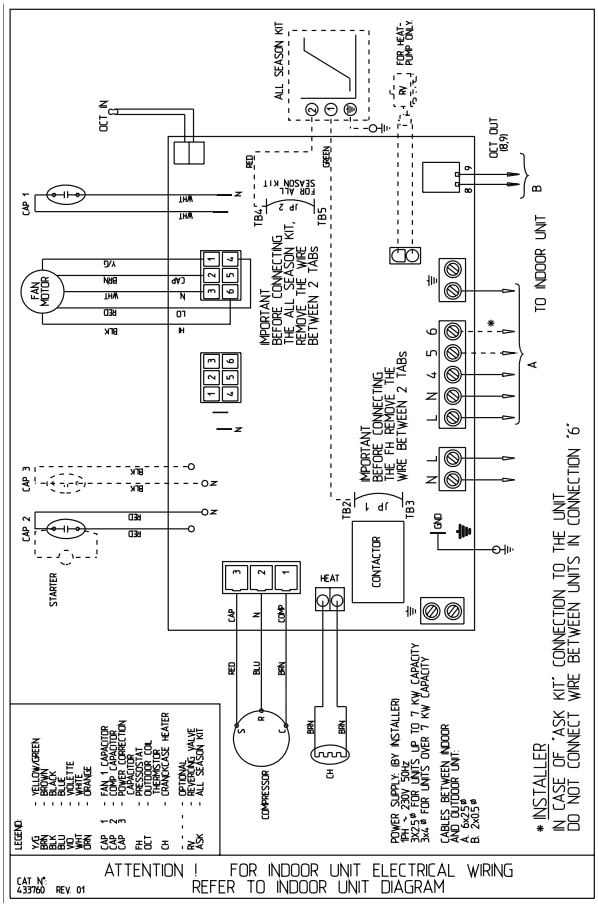


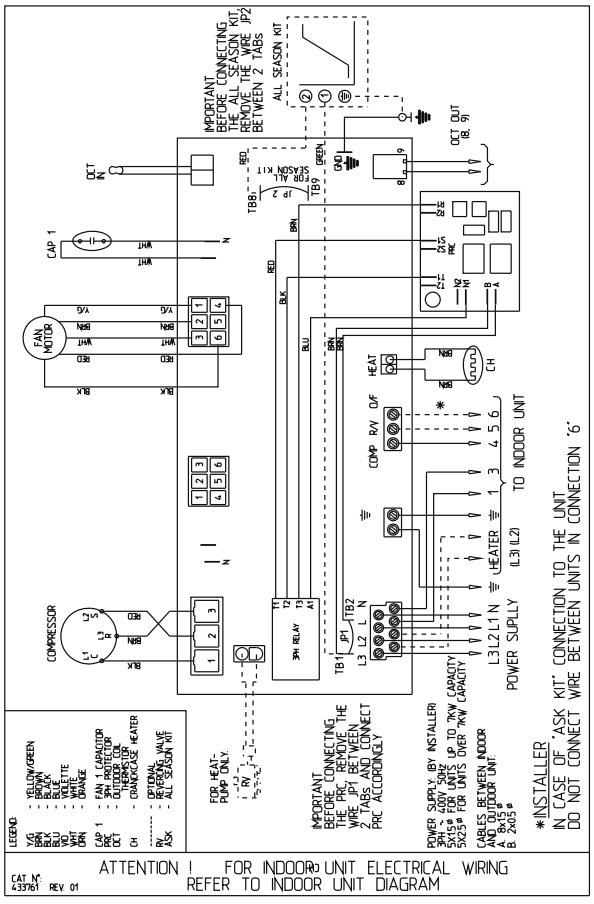
Fig.6

Fig.7

- Verify the wiring to electrical diagram.


ALL SEASON KIT
OCT IN
OCT OUT (8,9)
TO INDOOR UNIT
IMPORTANT BEFORE CONNECTING THE ALL SEASON KIT, REMOVE THE WIRE BETWEEN 2 TABS
IMPORTANT BEFORE CONNECTING THE FH REMOVE THE WIRE BETWEEN 2 TABs
CONTACTOR
STARTER
HEAT
COMPRESSOR
FAN MOTOR
* INSTALLER
IN CASE OF 'ASK KIT' CONNECTION TO THE UNIT
DO NOT CONNECT WIRE BETWEEN UNITS IN CONNECTION '6'
ATTENTION ! FOR INDOOR UNIT ELECTRICAL WIRING
REFER TO INDOOR UNIT DIAGRAM
CAT.N° 433760 REV. 01

1PH Unit


ALL SEASON KIT
OCT IN
OCT OUT (8, 9)
TO INDOOR UNIT
IMPORTANT BEFORE CONNECTING THE ALL SEASON KIT, REMOVE THE WIRE BETWEEN 2 TABS
FAN MOTOR
COMPRESSOR
HEAT
COMP R/V O/F
HEATER
POWER SUPPLY
* INSTALLER
IN CASE OF 'ASK KIT' CONNECTION TO THE UNIT
DO NOT CONNECT WIRE BETWEEN UNITS IN CONNECTION '6'
ATTENTION ! FOR INDOOR UNIT ELECTRICAL WIRING
REFER TO INDOOR UNIT DIAGRAM
CAT.N° 433761 REV. 01

3PH Unit

Fig.8

- Arrange the wires and capillary tube together with plastic ties, don't fold or break the capillary tube,keep a large loop for extra length of capillary tube.
- Check for refrigerant leaks.

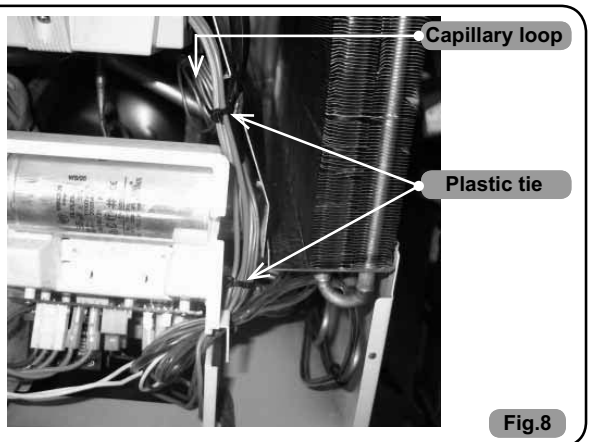


Fig.8

- Re-assemble the previously removed elements.

APPENDIX A

INSTALLATION AND OPERATION MANUAL

► **INSTALLATION AND OPERATION MANUAL DLS 18, 24, 30, 37, 44**

CONTENTS